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Editorials

WITHHOLDS APPROVAL OF GROUP HOSPITALIZATION UNTIL AT LEAST FIFTY-ONE PER CENT. OF DIRECTORS OF PROJECT ARE MEMBERS OF THE CHICAGO MEDICAL SOCIETY

Negotiations conducted by the Group Hospitalization Branch of the Chicago Hospital Service Corporation remain unconsummated.

The Chicago Medical Society Council based its refusal along the following lines:

A number of potential evils in the proposed plan must be mentioned, considered and guarded against.

The main idea to be retained by the medical profession is that the fundamental principle of all medical practice is that any activities for which medical men and their professional services form the nucleus *must remain under the control and decisive direction of medical men.*

Otherwise the profession and all its works will falter and die under the inadequate perspective of lay control.

The development of Group Hospitalization deeply concerns the proper control of professional activities as well as the public welfare. To the professional and experienced eye the two are one and the same since public welfare suffers under lay-controlled medicine.

Under the existing set-up of the Group involved, this present Hospitalization Group offers to medical men the representation of *seven* directors out of *fifteen,* of which, while two may be nominated by The Chicago Medical Society, *three* may be nominated by the affiliated hospitals and *two* more will be representing the administration. The picture is plain. Medicine may not wear blinders under those conditions but it certainly will appear in at least one handcuff and a ball and chain. But it is for the Council to decide whether this number is adequate. The Council confronts three paths; to approve the ordained arrangement; to disapprove it; or to table the matter for future action.

In view of the various conditions which have been set forth and to bring the affair to a final issue it is recommended that official approval of Group Hospitalization shall be withheld until at least fifty one per cent. of the directors of the project are restricted to members of the Chicago Medical Society. *Medical matters must be managed by medical men.*

Imminence of interference in the practice of medicine by political bureaus and lay-theorists working under government labels should evoke from the profession greater caution in avoiding uncertain or questionable or dubious entanglements.

Though the present Directorate of this Hospitalization Group is probably altruistic and inclined to maintain present policies, through Fate, fatigue, or resignation the personnel of this board may be expected to change within a few years. Such changes cannot help but be followed by alterations of method or purpose or both, and those changes may fall short of medical ideals. Those things have been known to occur. Frequently the sincerest altruism of a self-perpetuating body may develop into vastly different motives or sink into tyrannical self-indulgences.

Nor is there any safeguard but that possibly under some future management and in the thirst for expansion the hospitals may not only regret their present attitude but entertain seriously the thought that the hospital has a right to present medical care as well as hospitalization.

Doctors should remember that it is much easier to abdicate a throne than it is to regain it. A throne given up to those who are untrained in the use of its functions and powers is a crime against its subjects.

EVERY SAFEGUARD SHOULD BE THROWN AROUND GROUP HOSPITAL INSURANCE SETUP

Partisans for plans of Group Hospitalization, acting in all good faith, must evade the danger of setting up an apparatus that may function only as an additional gadget in the cause of compulsory health insurance and state medicine.

One of the possible hazards of Group Hospitalization is that not illogically the hospitals may be presumed to be receptive to the idea of assuming prerogatives far beyond their legitimate, scientific scope. Physicians throughout the United States have already become familiar with the sad spectacle of an alma mater competing professionally with its alumni in the practice of medicine. More parallel than analogous would be the sight of hospitals in group hospitalization units offering under the scope of the group hospitalization insurance plan, not only hospitalization but x-ray and other laboratory facilities and, eventually, even medical service itself.

Hospitalization makes its greatest play by being financially attractive to the laity, since the requisite ten or twelve dollars per annum is anything but onerous to any employed person, no matter how low his income, when it insures him for a year's hospitalization, should that need arise, and prepaid hospitalization at that. The initial argument for group hospitalization was that it would take care of the hospital and leave the patient free to take care of the doctor.

Investigation and appraisal turn up the fact however that this last statement needs to be taken with more than the traditional grain of salt. It raises, too, the query as to how much the hospital ultimately will take on its own shoulders and how much it will leave for medicine of the rights that belong to medicine! Surgery, obstetricts, clinical laboratories, x-ray, and laboratory specialties are all distant green pastures that shine before the eyes of the lay boards and directorates that control hospitals most generally throughout the United States. It is a scientific precept that *medical men should control all things and affairs that are medical.* The one way in which Group Hospitalization can be of use in the unit of public health and welfare is for the entire plan to be under the control of medical men. It will never do for the patient and the hospital, the lay-directed, endowed, managed and controlled hospital, to enter into any arrangement in which the physician is not only a negotiating but also a controlling factor. The insured and the insuring groups have been well-informed as to the details and ideas of this mutual pact, but there is a possibility that the doctor as an individual and the profession as a whole may find themselves on the outside looking in, instead of in the inside looking out, through their own failure to provide for the control.

And, in a quick review of the whole idea, what provision has been made in this scheme of Group Hospitalization for the indigent or the unemployed? That there is none would indi-

cate that the answer might be obvious to the eye and loud to the ear. The individual private practitioner will be as always responsible for the poor.

Therefore, as previously stated, the profession must be alert to the danger of endorsing projects which may in all seriousness fit in towards compulsory health inurance.

LAYMAN PUBLIC INTEREST IN MEDICAL COST IS PERHAPS MORE POLITICAL THAN HUMANITARIAN

Medical care, its cost and its administration, has suddenly become almost as burning a topic in legislative halls as was once the abolition of slavery, or the repeal of prohibition, or the granting of franchise to women.

Which would be gratifying beyond words to the medical profession were it not that this sudden *interest in "Medical Care" does not arise* from any desire for better medical care, either from an humanitarian or a scientific standpoint; nor from an actual equalization of opportunities for medical care,—though this is the fetish under which the crusade is being waged,—; nor from any yearning to better the slaves of this *exacting science,—i. e., ethical medical men,* though their post-war state is indubitably crying aloud in a deaf-eared wilderness for alleviation,—but rather because medical care, its costs and its ramifications have become one of the burning *political interests of the day.* To see the science dealing with public health and welfare, and, *per sequitur,* with national prowess and supremacy and wealth, become the pawn of politics, is the dread vista that this twentieth century has presented to the physicians of the world.

Germany, Great Britain and France are already in the toils of a medical profession sacrificed to the Juggernaut of unbridled, undisciplined, uninformed, rutherless, selfish, political jobbery. *Its encroachment upon the scientific* purity of American ideals, both of nationalism and of medicine, is a most deplorable disaster,—in fact, a terrible tragedy.

Three of the major continental powers, Germany, France and Great Britain, stagger under the burden of "State medicine," which is the goal towards which all this propagandizement of "medical care" is headed. And the whisper grows louder daily, and that to the dismay of every perspicacious physician, that "State Medicine," mask it as you will, is *far from being "Anathema" in the seats of the mighty of America.*

And *"That way madness lies."*

State medicine is one of the corner stones of communism. It is the substitution of *"The State"* for *Science.* And is by the very virtue of that substitution, gross robbery of the most precious possessions of that very State it smirks seemingly to serve.

"What is 'State Medicine'?" the layman asks and the query,—sad truth it be to admit—comes often from the very men who should be out and aboveboard fighting this monster at the gates.

Briefly, State Medicine is a scheme, by which every man, rich or poor, is over-taxed to underpay and to under-mine the very profession upon which depends the health and welfare, and hence *the wealth and prosperity of the nation.*

Begotten as a Bismarckian sop to the enslaved laborers in the Prussian mines over a half century ago, like all latent evil, this State Medicine has caught the trick of false bedizenment through will-o-the-wisp promises to beguile the theorists and dreamers of the world. Struck from the *flint of a false hypothesis, the sophistries of* "State Medicine" seem well on the way to set fire to the smoldering revolts of the world.

Setting aside the fact that the doctor fares so ill that he is sandbagged before the system of *State Medicine is well begun,* the truth remains that the people are taxed and retaxed to pay for a partial service from which they receive a sad fragment of return. As the Tahitian savage trades a magnificent pearl for a dime store mirror and three yards of pink calico, so under every system of State Medicine as yet devised the taxpayer swaps his purse for a mushroom promise and phantom ervice.

"Caveat emptor!" In "State Medicine" truly the purchaser pays and should beware. Survey of the results of "State Medicine" in those countries where this perverted form of medical attention rules, is enough to appal any honest mind.

Chiefly its sourest fruits would seem to be:—

1. Lowered morale on the part of the profession:

2. Inadequate service towards the clientele due to bureaucratic redtape, inadequate recompense and inadequate study and diagnosis of individual cases eventuating from a mass clientele:

3. Too much lay control of scientific practice:

4. Too political and too unscientific a control:

5. Too much taxation for results to taxpayers:

6. Government interference with affairs of nature too involved to be regimented under human mechanistics:

7. Development of a group of *"Malades imaginaires"* or of malingering citizens who find it more profitable to ail at the expense of the state than to follow the normal lines of industry:

8. NO REDUCTION IN DEATH NOR INCREASE IN BIRTH RATE.

9. Analagous ethical debauchery of the apothecaries and loss of profit to them as well as to dentists.

10. General chaos of method and confusion of ideals with no profit except to uninformed lay supervisors and inspectors.

The Physicians of the United States will do well in the coming year to tudy this question both from the point of the profession and the public but also of the public pocketbook which is after all, only the health and wealth of the nation.

State Medicine is the boldest brigand yet loosed to rob the world of a service as fundamental as life itself.

WHY AM I A DOCTOR?

Legislatures and general assemblies are in session all over the land. Under many a legislative roof the statutes are being saturated with socialistic poison. Lest the medical profession should feel that it has a right to ignore what the lawmakers are doing with complete disregard to the safety of both their rights as doctors and their rights as men it may be well to persue the following excerpts made recently by Floyd S. Winslow, M. D., President of the Medical Society of the State of New York, at the eighth district branch of the medical society of the State of New York at Buffalo, October 15, 1936, upon the topic "Why Am I a Doctor?"

"Once in a while, it will be good for us doctors to indulge in what might be called a 'periodic self-examination.'

"Certainly we are not doctors because of the money that is in it. Generally speaking, our companions of early years who selected business pursuits have outstripped us in gathering together the collection of objects which represents monetary success. *Why* did we go into medicine? *Why* do we stay in medicine? *Why* do we live for, *fight* for, and sometimes *die* for medicine?

"Glory? Where is the romance in our pursuit, for those who follow it? It is said that every ship is a romantic object save the ship we are sailing in, and medicine has romance for those who do not practice it. We work in the quiet of the sick room, or the hospital; we walk daily with troubled humanity. Our satisfaction can derive only from the knowledge that we have performed our obligation to heal the sick,—in this way paying the debt we owe for that accumulated knowledge and experience of the ages which has been made available to us.

"The great majority of doctors is imbued with the purpose to discharge this obligation. The public should be definitely told, that the most important thing it should inquire about, when selecting a doctor, is whether he is genuinely interested in his calling, loves his profession and is not only intent to attain ability as a physician but feels a responsibility to advance the capacities of the medical profession as a whole. This is, as you know, the main ideal and objective of medical societies. The man who has such a goal as this in mind as a destiny, is a man who can be fully trusted with the lives of men, and women and children. Let ue see how this works out.

"The test of this criterion is, in other words, a test of character. A man joins his county medical society. He considers that when he was given the right to practice medicine, he assumed an obligation to do his part to see that medicine, as a profession, preserved its integrity. The only way integrity can be attained or retained, is to work for it. When he joins his local medical society he works for the integrity of himself and his group. He renders himself open to the criticism of his peers. He says, in effect, 'I intend to behave myself, to put the interest of my patient above my own, to observe all the other provisions of the oath of Hippocrates, in letter and in spirit. And not only do I intend to do this, but by joining the county medical society *I have to do it*—I lay myself open to penalties if I do not.'

"The public should be told that a doctor who is a member of his county medical society is a better doctor on this account. I think a patient should ask his doctor, if he is not a member of the medical society, why he is not a member. It is possible, of course, that a physician may be of the highest rank, and not be a member, there is nothing compulsory about it, but as I go over in

my mind the names of the physicians who I find have lived so that their excellence is beyond possible question, I *do not think I can name one who is not a member of his county medical society.*

"Now if our loyalty to our profession is merely another form of loyalty to society—to mankind—a point comes up which I wish now to mention. The world today is facing deep and important problems. Confusion abides in the minds of men. Quacks are abroad plying their trade in the realm of *economics* and *sociology* as well as in that of *medicine.* Large groups of people are assuming to know that which they do not know. They are contemptuous of the experience of the past, and of the experience of individuals; they decry special skills; they substitute rhetoric for reason. So we have *another obligation, just as basic as the medical obligation,* and that is a *social obligation.* We must reach out and interest ourselves in these questions which are quite outside medicine, but which need a generous skepticism to counteract what often seems to be a pathological optimism. We have not repaid our debt to society when we merely heal the sick. *In some respects, the well need healing, too.* That is to say, if we are not to have all our values, and all our superiorities broken down. 'One man,' Mr. Dooley said, 'is not only as good as another, but a damned sight better.' There are no experts left. There are only simplifiers. And what are we doing about it?

This is not a matter of partisan party lines: the same kind of thinking is to be found everywhere. The public is coming to believe that it is capable of exercising its opinion, its judgment, on difficult technical problems, with no knowledge, no experience. Further than this the public expresses that opinion in response to a catchword. In fact the general public does not even make the effort to think a problem through on a rational basis, using the information, however inadequate, which it has in its possession. These are symptoms of grave danger. Sooner than we think, we may see the complete triumph of mediocrity. And there is only one way in which we medical men can make effectual remonstrance, and that is at the polls on each election day. Those who have made inquiry state that the *proportion of doctors who vote is only one in three.* Need I say that this is a disgraceful record? Need I urge you to consider its significance deeply, when so many public policies are formulating which may advance or retard the healing art? You know what various candidates stand for, and in general, if not specifically, what type of legislation may be expected of them. Your knowledge, your judgment, is ineffectual unless you vote.

"After you have asked yourself why you are a doctor, ask yourself another question, a larger question. Are you a citizen, in fact rather than in name, if you fail to exercise the obligations of a citizen in exchange for its advantages? If we work in our own societies to preserve the integrity of medicine but fail in the larger society of American affairs to preserve the integrity of our civilization, efforts on the one part may easily be frustrated by inaction on the other."

CONSISTENCY THOU ART A JEWEL

Up with the Muscle and Down with the Money Cries Health-Wealth Macfadden

Bernarr Macfadden, who was one of the first of modern magazinists to preach the freedom of the sexes to modern youth and weary spinsters, comes out now in his widely circulated five cent weekly and announces that health advice should be as free as air and water. Mr. Macfadden is another "physician who refuses his own physic." He may *think* that the advice should be as free as air and water but he certainly charges plenty at his so-called "health hotels" for the following of it! Further Mr. Macfadden,—and we will say this for him, he has managed to retain a healthy head of hair even unto the fullness of his years—is of the opinion, according to his editorials, even if not according to the instructions to his treasurer, that all "healers," no matter what the initials after their names, should be paid by the government. *Oi! Oi!* Truly the sun in descending casts grotesque and exaggerated shadows. Even the penumbrae grow peculiar. Once Mr. Macfadden decried inferior muscular development. Now he bewails superior money complexes on the part of all "healers," and by that he means all the "Doc"—Bernarr *never did* have much use for us, and now he is trying to prevent us receiving a living wage.

FAMOUS ACTUARY ASSERTS LAY CONTROL OF MEDICAL PRACTICE DEFINITE OBJECTIVE OF HEALTH INSURANCE

From an accredited actuary and scientific statistician with almost boundless experience of more than fifty years come these able comments upon the rapidly approaching burden of State Medicine which it would seem the United States is about to be called upon to assume. No words are minced; no facts exaggerated.

Writing on "Compulsory Health Insurance and Disease Control," Frederick L. Hoffman, LL.D., retired vice-president of the Prudential Insurance Company says in part:

"The proposed system of compulsory health insurance is *fundamentally opposed to our American conceptions of life and democracy with each and every one free to develop traits of competence and protect his own interests in sickness and health. The paternalistic system of Europe is un-American and opposed to the best interests of the population.* The system would lead to the regimentation of the medical profession, lower the standards of medical practice, impose heavy burdens on the family budget, and produce results less satisfactory than the present system. *The colossal sums that would be collected in the way of contributions would unquestionably be made the football of politics,* and any doctor in the system would be compelled to concern himself, more or less, with political questions affects ing his interests rather than follow his professional bent in the development of the science of medicine and make the interests of his patients his sole concern.

"Advocates of the system are chiefly social service workers whose philosophy of government is fundamentally opposed to that which has prevailed in the past and aims to bring about lay control of medical practice regardless of all pretenses to the contrary. Just as Great Britain modelled its system of compulsory health insurance after German methods of social control, it is now proposed to model an American system after the British. Once such a system is established it is next to impossible to repeal it or bring about profound modification. It becomes a part of the everyday life of the people who thus enter into bondage to the State in a manner involving the highest considerations of public welfare and social progress. What follows is based on many years of impartial study of the situation in England and on the Continent of Europe where compulsory health insurance has been in vogue for many years.

In the event that an American system becomes established it would unquestionably follow British precedent rather than German, Austrian or French which are less applicable to our situation.

"For the social security program of the present administration, including its larger aspects of compulsory health insurance of American wage workers and low salaried wage earners, European precedents are relied upon for guidance, particularly the system in vogue in England and Wales and Scotland. The proposal rests upon the theory that vast benefits will result from such a system, for which *compulsory contributions will be collected on a stated scale and dispensed by local bodies throughout the country. This would involve the establishment of a vast bureaucratic machine, the magnitude of which would be considerable.* Contributions are to be collected by deductions from the current wage, to which a stated proportion of federal and state aid will be given by way of supplementary assistance. It is claimed that under such a system the mass of wage earning population would receive decidedly better medical attention than at present is the case.

"In practice, however, it has been found that *the bureaucratic system established under such a method involves countless complications which hinder rather than help the progress of scientific medicine for the benefit of the people.* The medical profession would be divided into two classes, or those practicing state insurance and those who continue under a system of free competition in private practice. It is obviously a question of evidence as to which system is preferable for the benefit of the people."

BRING IN A NEW MEMBER

Help bring in at least one new member and thus forge another link in the County chain that makes up the great organization known as the ILLINOIS STATE MEDICAL SOCIETY. The stronger and more representative the group the more it can accomplish for its individual members. Your cooperation in this respect will help you and those whom you enlist in our ranks. If this were done it would give your organization tremendously increased financial

power and prestige and permit far greater accomplishments on the part of your officers for the good of all.

CHICAGO MEDICAL SOCIETY OFFERS BURGLAR AND HOLDUP PROTECTION

The Chicago Medical Society, through its Trustees, makes the following provision for the protection of members during 1937:

"Fifty Dollars ($50.00) reward will be paid by the Chicago Medical Society for the arrest and conviction of any person forcibly entering or stealing the car of a member, or stealing a grip or instruments therefrom, or holding up a member while engaged in the practice of his profession during the year 1937. Only one reward will be paid for convictions on combinations of the above offenses committed contemporaneously."

The sticker on your car will identify you to the Police Department and other law enforcing officers of Cook County.

It is suggested that members use these stickers on the right hand windows of cars above the door lock.

A DOCTOR WRITES WISCONSIN HISTORY

Dr. P. L. Scanlan, graduate of Rush Medical College and resident of Prairie du Chien, has written a history of Prairie du Chien from the day when it was the first settlement in the northwest to the present time.

The volume is the result of fifteen years of arduous, painstaking work on the part of Dr. Scanlan. Besides study of original records of the State Historical Society and records in Prairie du Chien, such as the Register of St. Gabriel's church written in early years in French, the author visited St. Louis, Quebec and Montreal to obtain first hand information.

Three years ago he spent several months in Washington, D. C., doing research in the Congressional Library and the War Department records.

The volume particularly features this original source of material in its chapters on military occupation and fur trading days in Prairie du Chien.

The work also covers some of the history of Green Bay as well as some of the general history of Wisconsin. The work represents an array of facts never assembled before. There are 13 chapters, approximately 300 pages, with appendices, notes, index and a few maps never used before, some of the maps made especially for the author.

The work appears in clear type and good paper and a cloth binding.

The work is published by The Banta Publishing Company, Manasha, Wisconsin. Price $2.50.

STATE MEDICAL SOCIETY, SECTION OF OBSTETRICS AND GYNECOLOGY

The program for the Section of Obstetrics and Gynecology of the Illinois State Medical Society, to be held at Pere Marquette Hotel, Peoria, May 18, 19 and 20, is now being made up.

Any member of the State Medical Society desiring a place on the program is requested to give the title and an abstract of the paper and to communicate with the undersigned. It is suggested that immediate action be taken as the number of places are limited. The papers will be limited to twenty minutes and discussion to three minutes each.

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104 South Michigan Blvd.,
Chicago, Illinois.

Secretary:
F. LaV Heinemeyer, M.D.
1201 Talcott Bldg.,
Rockford, Illinois.

EYE, EAR, NOSE AND THROAT SECTION OF THE ILLINOIS STATE MEDICAL SOCIETY

Chairman, Dr. John A. Cavanaugh reports that the Section will have a very interesting program at the May Meeting of the Society in Peoria, Ill. Papers will be presented by members of the Section on pertinent subjects. A number of nationally known members of the profession will take part in the program.

Dr, French K. Hansel, Assistant Professor of Clinical Otolaryngology at Washington University, St. Louis will be a guest of the Section and will present the subject of Allergy with reference to our specialties.

One afternoon of the meeting will be devoted to round table group discussions of various

phases of our specialties lead by men who know and the climax will be reached in the general session Thursday morning when one of our members will be on the general program discussion on the subject of "Infections."

C. B. Voigt, Secretary,
1702 Broadway, Mattoon, Ill.

WOMAN'S FIELD ARMY TO FIGHT CANCER

The Illinois State Medical Society through its Cancer Committee consisting of Dr. Bowman C. Crowell, Chairman, and Dr. J. P. Simonds, Dr. Don Deal, Dr. Roswell T. Pettit and Dr. Gatewood, has set in motion in Illinois the warfare against cancer as has been done in thirty-eight other states in the Union through the Society's cooperation with the American Society for the Control of Cancer. The present movement, which places the fight against cancer on an active plane, is made possible by the organization of the Woman's Field Army.

The State Commander of the Army, selected by the Cancer Committee of the State Medical Society is Mrs. George Thomas Palmer of Springfield, wife of Dr. Palmer who has been prominently identified for many years with tuberculosis and other public health activities. Mrs. Palmer has been President of the Illinois Federation of Women's Clubs, State Probation Officer and has been active in political and civic affairs.

"Fight Cancer With Knowledge" is the Slogan of the Army, the members of which, united in a common cause, will spread the gospel of prompt and competent diagnosis, making clear the fact that many cancers can be cured if discovered and treated in time. The Field Army will work in close cooperation with the State Medical Society, which will direct the medical work, the diagnostic clinics and provide medical speakers and programs for meetings arranged by the Army women.

The Field Army is being organized with a Vice-Commander in each of the eleven medical councilor districts so there may be as close a cooperation as possible between the Vice-Commanders and the Councilors. These Vice-Commanders, with the approval of the County Medical Societies or the President, recommend the appointment of County Captains. The Captains work closely with the County Societies, where there are such, and in turn, select the local Lieutenants.

Mrs. Palmer met with the Cancer Committee in Chicago on Janhary 8, presenting her plans of work and organization which were approved by the Committee. The Cancer Committee is the Executive Committee for the Woman's Field Army, Mrs. Palmer being the lay member.

The State Commander has consulted all the Councilors about the appointments of Vice-Commanders in their districts and has asked for leaders from all the important state organizations of women. It is hoped to make the Field Army as representative of all groups as possible.

The Women's Field Army, to do this tremendously important and much needed public health work successfully must have the warm support and sympathetic understanding of the local medical fraternity, as well as public support and financial help. These women do not pretend to be experts in cancer. They appreciate that the educational work will be carried out under the direction of the Cancer Committee of the State Medical Society and that all medical speeches will be made by competent physicians. The job of the Army is to create an audience throughout the entire state for cancer education and to form an aggressive and militant organization waging a war of facts against cancer, a war to save human life.

The first objective of the Army is the Enlistment Campaign, March 21-27, in which it is hoped that thousands of women will be enrolled as members at one dollar. The funds thus raised will go to support the future work of the Army. Men and women alive will be asked to contribute but only women are enrolled as members.

Bacteriologic studies in subacute bacterial endocarditis indicate that rough types of Streptococcus viridans are associated with the more virulent attacks of endocarditis whereas the smooth variety is found more frequently in the chronic cases. This finding indicates the importance of bacteriologic studies in this disease. Fox H., *J. Infect. Dis.* 58:230 (May-June) 1936.

A new vitamin (vitamin P) which cures pathologic permeability of the walls of capillaries to plasma protein, is reported. The new vitamin, closely allied to vitamin C, is found in Hungarian red pepper and lemon juice, and is apparently flavon or flavonol glycoside, one of the vegetable dyes. Rusznyak & Szent-Gyorgyi, *Nature* 138:27 (July 4) 1936.

MEDICAL ECONOMICS

W. M. Hartman, M. D.
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Edited by the Committee on Medical Economics
of the
Illinois State Medical Society
E. S. Hamilton M. D., Chairman
Kankakee, Illinois
Address all letters and communications to the Chairman.

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The two new subjects to come to the attention of the doctors of the state are the Campaign of Education on the subject of Syphilis and the Refresher Courses on Child Welfare in several counties of the state. The campaign of the first is well under way as we all know from reading practically any newspaper in the state. Dr. Jirka, Director of Public Health, has been most active in the campaign and has been able to enlist practically all sections of society in the problem. His close cooperation with the medical profession assures us that he will see that the rights of the medical profession are not infringed on. At a recent meeting of the Council it was voted to cooperate with him in the campaign. The Secretary of the Illinois State Medical Society attended the preliminary meeting at Washington last month and made a most comprehensive report at the January meeting of the Council as to what went on at that meeting. It is to be hoped that he will have a report of the meeting in this issue of the Illinois Medical Journal. It was announced at the Council meeting that free medication was nof available at the Springfield office of the Director for the treatment of syphilitics. All that is necessary is to write to them requesting the medicine. This should make the treatment of the disease much easier and less expensive to both the patient and the physician, who in the past has lost much money by treating without pay patient who either would not or could not pay. In either event the cost of the medication was borne by the individual physician. This, of course, was wrong and resulted in physicians refusing to render such treatment on any basis other than cash. This new arrangement will permit the physician to continue the treatment of the borderline cases with assurance that he will not have to spend his own money in the purchase of the drugs. We feel that the medical profession should cooperate fully in this work as long as it is carried along ethical lines, and we feel sure that as long as it is under the direction of Dr. Jirka no other lines are to be feared.

There will probably be considerable space in this issue of the Journal, given to the Refresher Courses in Obstetrics and Pediatrics, which are to be furnished free to the doctors of selected counties of the state, where the infant and obstetrical death rate is high. This work is to be financed under one of the titles of the Social Security Act. It is to be under the supervision of a special Committee selected by the Governor called The Committee on Infant and Maternal Welfare in cooperation with the State Department of Public Health. Again Dr. Jirka will be able to assure the medical profession that its rights will be respected. The personnel of the Committee contain such names as Dr. F. H. Falls, Dr. F. C. Grulee and Dr. Ferguson, in addition to Dr. Jirka. They have already selected a director for the work and will start the courses through the active cooperation of the local county medical society. If your county society is one of those selected for the work, we believe that you can be assured that it will be carried on in a strictly ethical manner and that you should cooperate fully at least until you are convinced that there is just cause for complaint. In that event, the facts should be brought to Dr. Ferguson, who as Chairman of the Committee on Education of the Illinois State Medical Society has been instructed to make use of his Committee to further the work. Like all new projects, some time must be allowed for organization and preparation for the courses.

We wish to remind the medical profession of Illinois that the annual meeting of the Northwest Regional Conference will be held at the Palmer house in Chicago on Sunday, February 14. This is an all day meeting, beginning at 9:00 A. M. and given over to discussion of subjects of economic interest. Every physician of the state is invited. There is no registration fee. The President and Secretary of every County

Medical Society should make an effort to attend the meeting. The officers of the Illinois State Medical Society expect to attend as well as the members of this committee.

The report of the Committee on Group Hospitalization, under the Chairmanship of Dr. C. E. Wilkinson of Danville, made a report at the January meeting of the Council and the same will be found following this article. The committee has done a large amount of work and their report should interest every thinking medical man of the state, particularly in the larger cities, where the formation of some kind of a group for Hospitalization will be proposed in the near future if any success attends the plans now in operation in Chicago and Peoria. Information to the Chairman of the committee says that at a recent meeting of the Council of the Chicago Medical Society, the Chicago plan was refused endorsement by a six to one vote. Such a vote should definitely answer the question, but we believe that the stand of the medical profession will not stop the plan being put in operation. The public appeal of the plan, the clever publicity used and the intelligence of the proponents make its continuance almost a matter of necessity. How well it will work out depends on many things and it is not smart to prognosticate. It is regrettable that if the plan will go on, the medical profession cannot and will not have a strong voice in the management of the same and the control of possible variations in the same.

E. S. Hamilton,
Chairman of the Committee
on Medical Economics.

To Dr. E. S. Hamilton,
Chairman Medical Economics Committee

Subject:—Group Hospitalization

From Dr. C. E. Wilkinson,
Chairman Sub-Committee on Group Hospitalization

Your Committee on Group Hospitalization began the study and investigation of the plan in the late summer of 1934. We found it a not especially recent plan. Some of the larger universities for some years have offered their student body an opportunity to participate in a so-called Hospital Service Plan. The University of Illinois has been operating a hospital service to the students since 1899. A sufficient number of students have subscribed to the plan to keep it in effect since its inception. Rockford, Illinois, has had a Hospital Service Plan in operation for the past twenty or more years. Dr. E. H. Weld reports that the plan is operating satisfactorily to the public, the hospitals and the physicians. Families of the workingmen in England have been able to pay their hospital bills through such voluntary insurance plans for more than ten years.

Dr. Justin F. Kimball of Baylor University, Waco, Texas, is given credit for organization of the first Group Hospitalization Plan that received nation-wide attention. In December, 1929, he formed a group of 1250 school teachers for hospital insurance at a rate of fifty cents per month, which operated successfully. This was for a single hospital.

Two factors that had much influence in bringing out some plan to reduce hospital expenses were: first, the report of the committee headed by Dr. J. Lyman Wilbur on the "High Cost of Medical Care," in which much stress was made on the expense of hospital care, placing it beyond the reach of the person with a low income; and second, with the advent of the economic crisis of 1929, hospitals suffered the ills of industry and experienced a decrease in bed occupancy, rising deficits, and in many cases approaching bankruptcy with consequent closure, created a panic psychology among hospital managers that led them to grasp at any proposal that sounded plausible.

In February, 1933, the American Hospital Association officially endorsed the principles of group budgeting for hospital care and also outlined certain features, which characterized a plan of Group Hospitalization as follows:

1. *Emphasis on Public Welfare, Rather Than Hospital Finance.* These plans were intended to enable subscribers to budget hospital bills, rather than to provide revenue to hospitals.

2. *Limitation of Hospital Services.* The benefits to subscribers should not include the services of private physicians.

3. *Free Choice of Hospital.* Subscribers should be free to choose from among several hospitals at the time of illness and no provisions should interfere with a subscriber's choice of physician or surgeon.

4. *Non-profit Sponsorship and Control.* Representative groups in the community should sponsor and control hospital service plans, rather than private investors who are primarily concerned with personal gain.

5. *Economic and Actuarial Soundness.* Expert judgment and opinion should be availed of in planning the

subscription rates, scope of benefits, payments to hospitals, etc.

6. *Dignified and Ethical Promotion and Administration.* The costs af administration should be as low as consistent with efficient control, and all public relations should emphasize the advantages of group-budgeting, rather than the merits of individual hospitals.

In March, 1934, the American Hospital Association reported that thirty cities in twenty-one states had started Group Hospitalization and that many other cities, notably New York, were giving special consideration to some plan of hospital insurance. Since the plan of Group Hospitalization was an insurance and must be operated under the Insurance Department of the State, special legislation had to be enacted. This was the case, as in New York, Alabama, North Carolina and Illinois and it caused some delay.

Your Committee communicated with physicians, many of whom were officials or ex-officials of the American Medical Association, connected with the Group Hospitalization Plan in different cities in the United States and practically all reports were favorable to the Plan.

At the Rockford meeting of the Council in January, 1935, we made the following report:—

"Considerable information on this subject has been garnered from various sections of the country where Group Hospitalization is in practice, all of laudatory character. It would appear to this sub-committee that there are many points in favor of such a plan. However, we feel that there is some reason for hesitancy in recommending such a move at the present time. There are certain pitfalls in the form of schemes for socialization of medicine. Unqualified endorsement of Group Hospitalization might lend encouragement to an allied plan for Group Medical Care at this moment of economic frenzy.

We suggest, however, that any community of members of our society wishing to inaugurate a Group Hospitalization plan receive hearty co-operation from this council, and whatever assistance we may be able to give, provided the specifications include the following tenets:

1. The plan must be acceptable to the local county society.
2. The majority of the board of control must be in the hands of the local county society.
3. The organization must be not for profit.
4. The plan must in no way involve medical service.
5. There must be no interference of the relationship between the patient and the physician of his choice.
6. The plan should be open to all hospitals of the Community."

During the year 1935, Group Hospitalization developed rapidly over the United States and by January, 1936, some form of budgeting for hospital service was in operation in over fifty communities in about thirty states. The plan differed to some extent in different communities but all featured the non-profit sponsorship and control and assured hospital service for a period of three weeks for a monthly payment of fifty to ninety cents.

Time will not permit a detailed description of the different plans of Group Hospitalization in operation. The Washington D. C. and New York Plans are followed by many states. The form set-up of these communities is as follows:

Washington Plan of group hospitalization;

Group Hospitalization, Inc., Transportation Building, E. G. Henryson, Director.

Established July, 1934. 18,000 subscribers enrolled December 31, 1935. Non-profit association with salaried employees; loan from Community Chest; 9 participating hospitals.

Subscription rates: $1.00 registration; $9.00 yearly to employed groups only.

Hospital service benefits: 21 days board and room service (semi-private accommodations), general nursing, operating room, anesthesia, laboratory, medicine, dressings; 10% discount after 21 days; x-ray service not included; maternity cases accepted (with delivery room and nursing service) at no extra charge, after 10 months.

New York Plan of Group hospitalization;

Associated Hospitals of New York, Inc., 370 Lexington Ave., Frank Van Dyk, Executive Director.

Established May 7, 1935. 40,000 subscribers enrolled December 31, 1935, including 5,000 dependents; 149 participating hospitals in Greater New York and northern New Jersey.

Subscription rates: For semi-private accommodations only; no registration fee; $0.90 monthly, $2.50 quarterly, $5.10 semi-annually, $10.000 annually; dependents enrolled at same rate and same benefits as employed persons; monthly payments through places of employment only; others may be made direct to Associated Hospitals of New York, Inc.; minimum of 10 subscribers in employee groups; age limit 65; no physical examination; no occupational restrictions or salary limitations; 10 day waiting period for ordinary sickness, none for accidents or emergencies; 10 months waiting period for obstetrical cases; patient admitted only through physician.

Hospital service benefits: Semi-private room, operating or delivery room, laboratory, films and fluoroscopies, x-ray, ordinary drugs and dressings, anesthesia if given by a hospital employee, basal metabolism tests, insulin, serums. Patient receives $4.50 credit on room rate when occupying private rooms at own request. Foregoing benefits for 21 days, one-fourth discount thereafter.

Payments to hospitals: Hospitals reimbursed at flat

rate of $6.00 per day for services to subscribers for 21 days and at $1.50 thereafter indefinitely.

Officially endorsed by local medical society.

St. Louis has had Group Hospitalization in operation for the past eight or nine months. It is a unit of the Medical Economic Security Program. (They claim it is the first instance in this country where a Medical Society inaugurated its own Group Hospitalization program.) It is operating under the Medical-Dental Service Bureau of St. Louis. The Missouri State Medical Society has endorsed the plan and they claim it is operating to the full satisfaction of the medical profession as well as the hospitals. The officers are members of the Medical and Dental professions.

Other State Medical Societies have endorsed Group Hospitalization and are cooperating in its operation. The Medical Society of the State of North Carolina is a joint sponsor of the statewide plan in that state. The Alabama State Medical Society is co-operating with the Hospital Service Corporation of Alabama in the Group Hospitalization plan. A letter from Dr. C. N. Carraway of Birmingham, Alabama, Treasurer of the Corporation, states that "we are getting one hundred per cent support from the hospitals and medical profession." In closing his letter, he states: "By the way, the law requires that there be one rate governing the State in regard to charges for services and the rate paid the hospitals for services rendered. This is incorporated in the State Law. The medical profession thought it best to do this to cut out bidding and underbidding and that all the rates charged must be approved by the State Hospital Association, State Board of Censors of the Medical Association, and the Insurance Department of the State of Alabama. It is truly a non-profiting corporation and can not pay any dividends to anyone. The rates can be lowered or raised according to cost of operation, according to State Board of Censors of the Medical Association, the Alabama Hospital Association and the Insurance Department."

The legislature of Illinois passed a law in June, 1935, legalizing hospital insurance and since that time only two applications have been filed for the privilege of starting the plan of Group Hospitalization; viz., the Hospital Service Corporation of Chicago; and one from Peoria. I have not learned the progress of the Peoria plan but they report that the Peoria County Medical Society has endorsed the plan. A recent letter from one of the officials of the Chicago plan stated: "The Chicago Plan was offered to the public December 11, 1936. The first two Companies to participate in the plan were National Broadcasting and Rand McNally. All of the leading hospitals in Chicago have signed the contract with the Corporation. I have heard that only one hospital medical staff voted against it. However, I have not verified this rumor. The Chicago Medical Society has not taken official action regarding it nor has the Hospital Service Corporation asked them for approval. They have been invited to appoint two members to serve on our Board of Directors that will be comprised of five physicians, five hospital trustees and five hospital administrators.

"The Corporation has, in its files, approximately 400 letters from employers of labor requesting that the plan be explained to their employees as the result of the very small amount of publicity to date. In view of the interest being shown in the plan increased publicity is not indicated."

Through the courtesy of Dr. Charles B. Reed, I was privileged to attend a meeting of the Council of the Chicago Medical Society, November 24, 1936, at which time the plan for Group Hospitalization was presented by officials of the Hospital Service Corporation. A recent letter from Dr. Robert Hayes, Secretary of the Chicago Medical Society, stated that, "the Committee has had several meetings but as yet has not arrived at any definite conclusions in regard to the plan."

In the many communications we have had from physicians and hospital officials where Group Hospitalization is in operation, a general expression of approval is dominant and great public interest is shown. In most places there is a contant increase in the number of subscribers. New York now reports about 250,000 subscribers and nearly 1,000 new subscribers daily and are now offering 28 days hospital service.

Dr. J. Howard Beard, Health Officer of the University of Illinois, in replying to my inquiry about Hospital Service Plan for students, December 23, 1936, stated: "In conclusion, I think it might be properly said that the arrangement of the Students' Mutual Benefit Association is thoroughly satisfactory to local physicians, that a number of them on many occasions have rec-

ommended its being made compulsory for all students, that this semester about 7,500 students are members of the Association, and that there is a movement on foot among the students themselves to have an arrangement whereby all students would be required to join the Association. This will probably not become effective until the McKinley Hospital has more beds. Sooner or later the bed capacity of the hospital will have to be increased due to the fact that the local hospitals are about up to capacity and they do not take patients with communicable diseases. The membership fee is $3.00 (semester), no payment is made for doctors' bills, the student selects his own physician who renders him whatever bill he thinks is equitable."

Students may not come in the same class as the groups in business and industry. Rooming houses and fraternity buildings are not desirable places to care for the sick students and the same may be applied to the average home of the low scale wage earner.

In this report it has been my desire to report the facts concerning Group Hospitalization as I have collected them from many sources. I have avoided expressing my personal opinion. No doubt, there are many points in favor of Group Hospitalization as concerns the public, the subscriber and the hospitals but to the physicians' point of view some objections can be raised. Several years may be required to prove it a success or failure.

Group Hospitalization concerns three parties: the subscriber, the hospital and the physician. Each is necessary for its successful operation; surely the medical profession should have some representation and control of such a plan, as suggested in our report in January, 1935.

In Conclusion, we may say that:—

1. Group Hospitalization is not a dream or something imaginary. It is a live subject and in active operation.

2. The plan is not entirely new. It is not a "New Deal."

3. The plan of budgeting for hospital service has made and is making a wonderful appeal to the lower bracket wage earner and the public.

4. The plan offers or assures the hospital compensation for use of its facilities of service.

5. The plan may lead to budgeting for Medical Services or Health Insurance.

6. The plan may lead to rivalry or competition among hospitals in which they exploit the members of their staff.

7. The plan has been endorsed by many state, county and city medical societies.

8. There is no apparent reason that the Council should at this time endorse the plan.

9. The plan concerns three parties: the subscriber, the hospital and the physician. One to be served and two to render the service. To be successful there must be cooperation.

10. "Medicine is not entirely dependent, neither can it be exactly independent. Without the public there would be no medicine, without medicine there would be no public; then, medicine is inter-dependent with the public."

Correspondence

SMALLPOX

All Physicians in Illinois: The attention of the medical profession of the State of Illinois is called to the fact that there is an existent outbreak of smallpox in Beardstown, Cass County, which has already extended to Morgan, Shelby, Rock Island, Vermilion, Sangamon and Cumberland Counties.

In order to prevent a potential epidemic the physicians of Illinois are asked to immediately begin vaccinating those patients who either have never been successfully vaccinated or who have not been successfully vaccinated within the past five years.

It is essential that cases or suspected cases be reported immediately to the local health authorities in order that prompt isolation and quarantine may be instituted. If there is any doubt as to diagnosis particularly from the point of view of differentiation between chickenpox and smallpox, upon request the Illinois Department of Public Health will be glad to immediately supply a member of its staff for final decision in the matter. Where there is any doubt as to diagnosis, the case should be reported as a case of suspected smallpox until final disposition is made.

The attention of the physician is called to the fact that every case of smallpox seen by us to date in this recent outbreak has had an acute onset with a fever of 102 to 104, chills, headache, backache and generalized aching followed

at the end of the third day or the beginning of the fourth day by a papular eruption appearing on the face, anterior surfaces of the wrist, then the remainder of the upper extremities, the upper thorax and anterior surfaces of the lower extremities. The palms of the hands and the soles of the feet have been rather extensively involved. All cases to date have been of the discrete variety.

In view of the existent outbreak, any unvaccinated individual presenting the symptoms of influenza should be looked upon with suspicion and should be watched closely for the first three or four days for the possible development of the typical eruption of variola. It should also be emphasized that the diagnosis of chickenpox in an adult must be made with extreme caution inasmuch as the majority of such cases eventually prove to be smallpox.

The virus for vaccination against smallpox will be supplied by the Illinois Department of Public Health free of charge to any physician upon request.

Frank J. Jirka, M.D.,
Director of Public Health.

DR. ANNA M. BRAUNWARTH

A member of the Chicago Medical Society since 1897, Dr. Anna M. Braunwarth will celebrate her eightieth birthday on January 11, 1937.

Dr. Braunwarth was born January 11, 1857, at Muscatine, Iowa, and graduated in medicine in 1886 from Northwestern University Woman's Medical College.

In the Braunwarth family, three of the sisters were physicians, and all practiced medicine over fifty years. Dr. Sarah Braunwarth, deceased, practiced fifty-two years. Dr. Emma Braunwarth is now in her fifty-sixth year of active practice at Muscatine, Iowa, and Dr. Anna M. Braunwarth is entering her fifty-first year of practice here in Chicago.

Dr. Anna Braunwarth taught medicine at Iowa State University and at the University of Chicago under Dr. Ralph Webster and Dr. Howard T. Ricketts. She was surgical assistant to Dr. H. T. Byford for nine years.

As a regular attendant at medical meetings, both of the Central Society and the Branches, no one can approach Dr. Braunwarth's faithful record.

The Chicago Medical Society wishes to extend its heartiest congratulations to Dr. Braunwarth on her eightieth birthday.

Thomas P. Foley, M.D.
President.
Chicago Medical Society Bulletin

EDUCATIONAL COMMITTEE SPONSORS NEW PRESS SERVICE

The Educational Committee is preparing to furnish a new style health column to newspapers of Illinois. Believing that editors might be interested in short, terse, clear statements concerning health conditions prevailing each week in the state, such material is being prepared for publication.

The first article on *Pneumonia* was sent out on January 28th and on February 1st editors of Fifty newspapers had sent in requests to be placed on the mailing lists to receive similar articles every week.

PNEUMONIA TAKES ITS TOLL

According to reports issued by the State Department of Public Health of Illinois, pneumonia reached a considerably higher reported prevalence peak as the New Year began than at any previous time since December, 1928. For the week ending January 4, 1937 a total of 1,056 cases were reported. The peak of the epidemic wave has past but because prevalence is likely to continue at a relatively high level until April there are certain facts the public should know.

* * *

Pneumonia is an acute inflammation of the lungs caused by a definite germ—the pneumococcus. It is a disease in which the patient is extremely ill from the very onset; it runs a relatively short course, seldom lasting over seven to nine days, at the end of which time, if the patient gets well, the fever suddenly disappears and the patient is on the road to recovery. On the other hand, it is a disease of such severity that for the population as a whole the death rate is the highest of the acute infectious diseases.

* * *

Many cases of pneumonia are preceded by an ordinary cold, which may have lasted from a few days to several weeks before onset of pneumonia. While every cold is not followed by pneumonia, the fact that nearly every case of pneumonia is preceded by a cold means that colds should receive more attention from the public than has been true heretofore. Colds are responsible for more "lay off" periods among workers than any other disease.

* * *

It is extremely unwise to try to work off a cold, or to keep going, waiting for it to wear itself out. Any individual who is suffering from a cold or temperature

or severe cough, should take sufficient time away from his work to make a complete recovery.

* * *

Chronic alcoholism, chronic diseases as Bright's disease, heart disease, diabetes, and such conditions as poor nourishment, or if you wish, ill health are all predisposing factors to the acquiring of pneumonia. Persons who have these conditions should take unusual care of avoiding exposure.

WOMAN'S AUXILIARY TO THE ILLINOIS STATE MEDICAL SOCIETY

To many wives of physicians it is not easy to define the objectives of the Woman's Auxiliary to the Medical Profession.

To the active members of our auxiliary there is a clearer conception of these objectives which we classify under the headings: Educational, Social and Philanthropic.

In this article we shall consider only the educational phase.

Since we, the doctor's wives, are a part of the laity, and because we are peculiarly fitted by virtue of our position in the doctor's home, living in an atmosphere of health consciousness, we can be leaders and teachers in the matters of health in our respective communities.

To be well informed we ned the *Hygeia Magazine*—the text book on Health Education, whose policy is—"To interpret to the layman in simple understandable language information about scientific measures that are now employed or may in the future be used in prevention and cure of disease. It likewise aims to deal with economic, social, political, industrial and educational problems so far as they have a bearing on the health and welfare of the people."

The policy of the Hygeia Committee of the Woman's Auxiliary to the American Medical Association, of which we the State Hygeia Committee are a component part, is, stating it briefly—"To try earnestly to inspire our physicians' wives to read and study *Hygeia* and therefore become better acquainted with its value to the physician, not only by stimulating respect for the high ideals of the profession but by educating our people against the danger of accepting advice from quacks, cults or any untrained person not qualified for giving out anything so vital as information regarding our life and well being."

And so, in the final analysis, may I, as Chairman of this committee, appeal to every physician's wife in Illinois to place her subscription for *Hygeia*. If you will do this, reading each issue carefully, you will find you will be qualified to answer the questions of the lay mind in your club and your community. You will become a Missionary of the Gospel of Good Health and your husband will place a copy of *Hygeia* each month on his reception room table that his patients may be informed in the best interests of organized medicine.

INEZ HOLE (MRS. M. L.),
Chairman Hygeia Committee Woman's Auxiliary to The Illinois State Medical Society.

NORTHWEST MEDICAL CONFERENCE

Palmer House
CHICAGO, ILLINOIS

Sunday, February 14, 1937

8:00 A. M.—BREAKFAST—8:00 A. M.

Informal discussion. Questions to be written and handed in—and assigned to individuals for discussion.
Election of Nominating Committee

Morning Program—9:30 A. M.

President W. F. Braasch, M. D., Rochester, Minn., Presiding.

Postgraduate and Economic Education

Symposium on Postgraduate Education:

9:30—Report of Survey—R. L. Sensenich, M. D., South Bend, Ind.

9:50—University Courses—Harold S. Diehl, M. D., Dean, University of Minnesota Medical School, Minneapolis, Minn.

10:00—Refresher Courses—M. H. Rees, M. D., Dean, University of Colorado School of Medicine, Denver, Colo.

10:10—Formal Local Courses—S. D. Maiden, M. D., Council Bluffs, Iowa.

10:20—Interstate Postgraduate Courses—J. D. McCarthy, M. D., Omaha, Neb.

10:30—Clinic Courses—Herman H. Riecker, M. D., Ann Arbor, University of Michigan.

10:40—Discussion led by—Ralph R. Wilson, M. D., Kansas City, M. C. Smith, Executive Secretary, Nebraska State Medical Society, Curtis.

Symposium on Medical Economics:

10:55—Economic Education—E. J. Carey, M. D., Dean, Marquette University School of Medicine, Milwaukee, Wis.

11:15—Economic Education of the Medical Student—Wm. J. Burns, Executive Secretary, Michigan State Medical Society, Lansing, Mich.

11:25—Economic Education of the Doctor—E. S. Hamilton, M. D., Kankakee, Ill.

11:35—Discussion led by—E. F. Kemper, M. D., Denver, Colo.; T. F. Thornton, M. D., Waterloo, Iowa.

11:50—Greetings from the American Medical Association—Olin West, M. D., Secretary, Chicago, Ill.

12:05—Hospital and Health Insurance—James L. Smith, M. D., Peoria, Ill.

12:20—Discussion led by—John R. Neal, M. D., Springfield, Ill.; Carl F. Vohs, M. D., St. Louis, Mo.; T. A. Hendricks, Executive Secretary, Indiana State Medical Society, Indianapolis, Ind.

LUNCHEON—12:30 Noon
Guests of the Iowa State Medical Society
Remarks by President W. F. Braasch
Election of Officers for 1938.

Afternoon Program—2:00 P. M.

Symposium on Social Security Activities.

2:00—Survey of Activities of State Governments and and State Medical Societies—Chas. S. Nelson,

Executive Secretary, Ohio State Medical Society, Columbus, Ohio.

2:30—Maternal and Child Welfare—Alfred W. Adson, M. D., Mayo Clinic, Rochester, Minn.

2:45—Public Health Services (Resetlement Administration)—A. D. McCannel, M. D., Minot, N. D.

3:00—Discussion led by—S. E. Gavin, Fond du Lac, Wis.; Elmer G. Balsam, M. D., Billings, Mont.

3:30—Venereal Disease Program—Arthur D. Gray, M. D., Topeka, Kan.

3:45—Discussion led by—Paul A. O'Leary, M. D., Rochester, Minn.; Earl Whedon, M. D., Sheridan, Wyo.

4:00—State Boards of Health—Frank J. Jirka, M. D., Director of Public Health, State of Illinois, Springfield, Ill.

4:15—Discussion led by—Philip H. Kreuscher, M. D., Chicago, Ill.; J. F. D. Cook, M. D., Langford, S. D.

CALIFORNIA STATE ASSOCIATION INCREASES ANNUAL DUES

California and Western Medicine, December, 1936, is authority for the following:

At the annual session of the California Medical Association, held in Coronado, May, 1936, the House of Delegates approved the recommendation of the Reference Committee that, for the year 1937, the dues of the State Association be increased by $5. The vote by the House of Delegates on the Reference Committee's recommendation was unanimous, not a single one of the more than one hundred delegates, representing the thirty-nine component county societies, asking any questions or making any protest. This unanimity was not to be interpreted as an expression of indifference on the part of the delegates concerning the hardship that might be caused by the five-dollar increase in State Association dues, but rather as a recognition by the seated members concerning the issues confronting the medical profession at the present time—issues which are so vital to the interests of each member that, even though it might hurt to give, there was no other logical course to follow, if the collective and individual welfare of members of the Association were to be adequately safeguarded during the coming legislative year.

ARMOUR LIGATURES

Armour and Company has been licensed to import surgical ligatures and sutures into Great Britain, it was announced by S. B. Bradshaw, manager of the Armour Laboratories.

"Regulations for sale of ligatures and sutures in the United Kingdom are very stringent," Mr. Bradshaw said. "The British Ministry of Health is empowered to prohibit the sale of any therapeutic substance which fails to meet its standards. Products are subject to constant tests and licenses may be withdrawn at any time. All licenses must be renewed by the manufacturers or importers every two years.

"Entirely new facilities enable the Armour Laboratories to manufacture and sterilize ligatures by processes which meet with the full approval of the British Ministry. The same products are sold in this country."

HOSPITALS SPEAK

The Medical Recorder, December, 1936, is authority for the following:

It is reported that the Association of Oregon Hospital meeting December 8, 1936 in Portland resolved that their members would no longer extend special low rates to certain groups enjoying such privileges in the past. Henceforth all organizations would be charged the State Industrial Accident Commission rate, which rate is at the present $2.57 per ward bed per day. However, on and after January 1, 1937, the rate for State cases is to be raised to $3.00. This then will be the minimum rate extended any individual or organization. It was further reported that the actual cost of operation per patient per day averages about $4.00 amongst the various hospitals, and private individual patients must accordingly be charged enough additional money per day to balance the operating budget.

As in the past, when the financial circumstances of a patient render him unable to pay the regular rate, a special rate will be permissible.

MID-WEST CONFERENCE ON OCCUPATIONAL DISEASE

"The Mid-west Conference on Occupational Disease will be held at the Hotel Statler in Detroit, on May 3-7 inclusive, in conjunction with the annual meetings of the American Association of Industrial Physicians and Surgeons, and Michigan Association of Industrial Physicians and Surgeons."

Adequate treatment in suprarenal insufficiency may entail the use of large doses of cortical extract and saline. In an unusually severe case showing marked neurologic symptoms a prompt response followed injection of 3500 cc. of normal saline and the administration of 50 cc. of cortical extract. Treatment with large doses of saline and cortical extract was continued in this case for a week. This report concludes that: "Recovery even from the severest degree of suprarenal insufficiency is possible if adequate amounts of cortical hormone and sodium salts are given." *Snell and Morlock, Proc. Staff Meet. Mayo Clin.,* 11:551 (August 26) 1936.

Serum sickness is favorably influenced by administration of calcium salts. Using alternate case method of treatment it was found that calcium gluconate, by parenteral injection, reduced duration of the rash from 5.4 to 2.9 days. In the controls, symptoms (itching, arthralgia, etc.) lasted 7.1 days as compared with 3.3 days for the treated group. Curphey and Solomon, *New England J. Med.* 214:150, 1936.

Original Articles

REDUCING INFANT MORTALITY

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The content of this discussion relates to the situation in Chicago because I am most familiar with it.

Thirty years ago, in Chicago, out of every thousand babies born 115.5 died before they were one year of age. Thirty years is chosen because it is an easy number to remember; there had been rates slightly lower before and there were to be much higher rates to come. The succeeding years are punctuated with such records as: In 1908, 128.3 the highest rate since the beginning of the century; in 1913, 122.3; in 1916, 122.4. During the twenty-year period succeeding 1916 and bringing us to the present, there has been a continuous decline in the rate; in 1935, the rate of 40.1 was attained, the lowest of all time and the lowest rate among the largest cities of the United States. It is due to unflagging enthusiasm and interest in saving babies' lives on the part of Dr. Herman N. Bundesen that this rate has been achieved, first as Commissioner of the Department of Health and lately as President of the Board.

This decline over the thirty-year period is shown in the graph.

Such a consistent and continued decline could not have come about by chance. There must have been a systematic application of forces at certain or all points to have caused the curve to follow the direction indicated by the statistics.

Read before Section on Public Health & Hygiene, Illinois State Medical Society, Springfield, May 19, 1936.

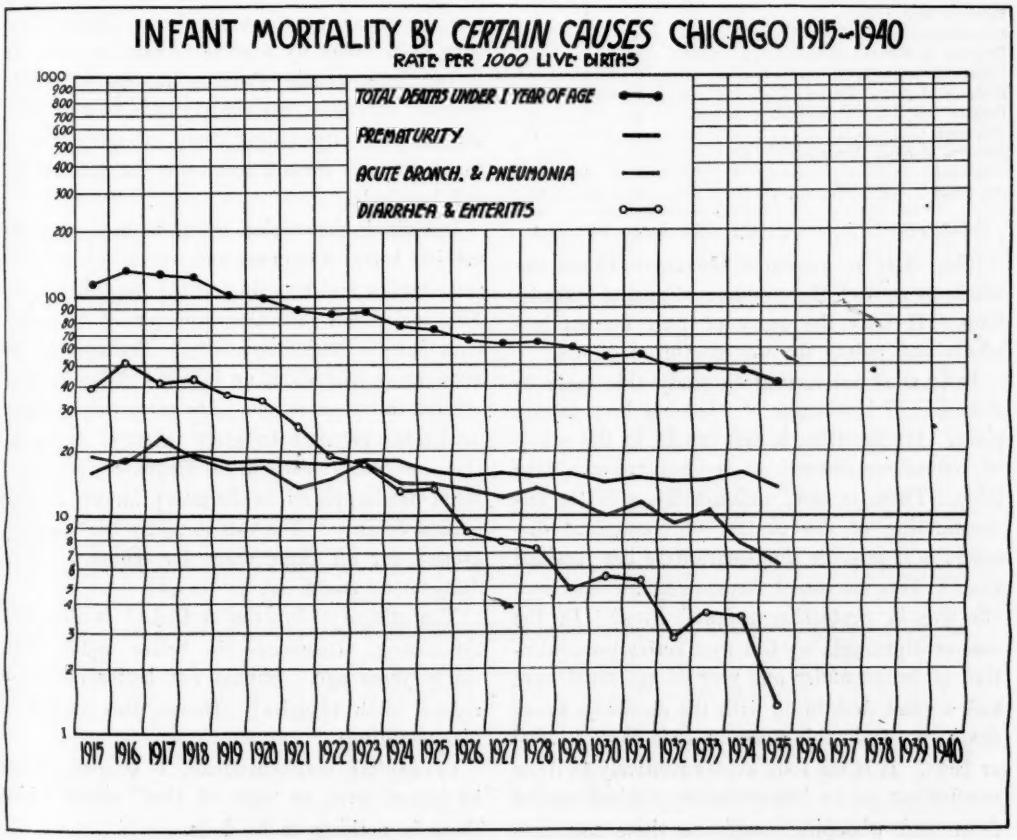

Chart 1. Showing Infant Mortality in Chicago, by Certain Causes, 1915-1935.

TABLE 1—CAUSES OF INFANT DEATHS THE FIRST YEAR OF LIFE

	1905	1908		1935	
Mortality rates	115.5	128.3		40.1	
Causes	Total	Total	Male	Female	Total
Measles	48	50	2	4	6
Scarlet Fever	5	24	2	1	3
Whooping Cough	187	63	13	16	29
Diphtheria	24	47	1	1	2
Influenza	19	29	6	3	9
Dysentery	22	30	2	0	2
Erysipelas	28	35	7	3	10
Epidemic Meningitis	0	101	5	1	6
Tuberculosis	102	96	10	9	19
Syphilis, Congenital	80	92	15	7	22
Thymus gland disease	..	..	13	11	24
Diseases of Ear and Mastoid	5	..	7	4	18
Diseases of Circulatory system	34	37	8	3	11
Bronchitis	401	425	11	8	19
Pneumonia	851	851	180	122	302
Diarrhea and Enteritis	538	2606	45	24	69
Intestinal Obstruction	36	38	7	11	18
Peritonitis	..	..	1	2	3
Congenital Malformations	108	526	125	109	234
Congenital Debility	441	484	7	2	9
Premature Birth	343	633	403	287	690
Injury at Birth	54	234	147	92	239
Diseases Peculiar to Early Infancy	229	1117	74	51	126
Accidental and Violent Deaths	39	334	7	18	25
Leukemia	3	0	2	2	4
Meningitis—Simple	..	..	2	4	6
Cerebral Hemorrhage	9	15	1	3	4
Convulsions	476	188	4	0	0
Diseases of Nervous System	..	353	1	2	3
Pleurisy	..	1	7	1	8
Diseases of Buccal Cavity	1	6	7	3	10
Pyelitis	1	..	3	3	6
Phlegmon	..	..	4	0	4
Diseases of Skin, Annexia	13	27	3	3	6
Infanticide	3	53	7	1	8
All Other	..	..	19	13	32
Grand Total	5831	6888	1158	825	1983

This table is presented because it shows the whole picture of the problem of saving infants' lives. It tells the story of past accomplishments and points the way to future efforts.

It is most interesting to study this table in the light of knowledge of what has been taking place. Our attention is first caught by the group of contagious diseases at the beginning of the table. There is now, undoubtedly, a better understanding of the control of contagious diseases; is it possible that quarantine has justified itself? Has the use of serums and vaccines been effective in protecting infants' lives? In the case of diphtheria we feel that active immunization of babies under one year of age must have had a great deal to do with the decidedly lower death rate from this cause in 1935 than in 1905 or 1908. It is too soon even tentatively to draw conclusions as to immunization against scarlet fever and whooping cough as these measures have not been applied to large numbers.

The tuberculosis figures are significant when we remember that this has been a most active period in the control of this disease. Certainly, I think we have a right to believe that the good results of this program are reflected in the death rates of infants.

Too many babies still die from pneumonia, but notice the great improvement in the present rate over that of thirty years ago. No magic procedure has been developed in the treament of this disease. Has our modern regimen of child care developed a greater resistance to this disease, and have we learned intelligently *what not* to do in its treatment?

And now we come to the gastro enteral group of diseases. It is usually said that the decrease in the loss from this cause accounts chiefly for the lowering of the infant death rate. But, as we are seeing, there have been ofter factors. I almost stated that the story of gastroenteritis has been told, but this would not have been true. There are still deaths from this cause—and probably most of them needless. Perhaps we have been lulled by a sense of false security as to our impregnable position in regard to this disease; only this year reports have been coming in, our own city among them, of outbreaks of gastroenteritis among newborns in institutions and hospitals.

Intestinal obstruction interests me. Are we making better diagnoses and operating on these cases earlier and so reducing the mortality rate? The period has seen the development of pediatrics into a major specialty. Perhaps we *do* know more *now* about an infant's abdomen than we did thirty years ago. The same might apply to disease peculiar to early infancy. Some of these we have learned to diagnose and treat. What has happened to the group known as congenital debility? Was this formerly the dumping ground for all those cases for which a better designation could not be found?

The category "Injuries at Birth," is also most interesting. Obstetrics is better today than thirty years ago. Should not better obstetrics reduce birth injuries? Hence, this record is disappointing.

Congenital malformations, I suppose, must be passed over as "acts of God" about which there is nothing to be done.

Convulsions as an entity has disappeared.

TABLE 2—Infant Deaths By Cause, Sex and Age Group—1935

INTERNATIONAL CLASSIFICATION OF CAUSES OF DEATH	Under 1 Day		Days 1-6		7-13		14-29		Months 1		2		3-5		6-8		9-11		Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
7—Measles	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	3	1	1	2	4
8—Scarlet Fever	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1	2	1
9—Whooping Cough	..	..	..	..	..	..	..	..	3	7	1	4	5	2	3	1	1	2	13	16
10—Diphtheria	..	..	..	..	1	..	..	..	..	1	..	..	..	..	..	..	..	1	1	2
11 a&b—Influenza	..	..	..	..	..	..	..	..	1	..	2	1	2	..	1	2	..	..	6	3
13 a&c—Dysentery	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	2	0
15—Erysipelas	..	..	..	..	..	..	2	..	3	2	2	..	..	..	..	..	..	1	7	3
18—Epidemic Meningitis	..	..	..	..	..	..	..	..	1	..	1	..	2	..	1	1	..	..	5	1
23-32—Tuberculosis (All Forms)	1	1	..	..	..	..	..	..	1	..	..	..	1	1	2	4	5	3	10	9
34 a—Syphilis, Congenital	2	3	1	1	3	1	3	..	2	..	3	1	1	..	..	..	..	1	15	7
67 a&b—Diseases of Thymus Gland	3	2	1	3	1	1	1	1	1	1	3	..	2	2	..	1	1	..	13	11
89—Diseases of Ear and Mastoid Process	..	..	..	..	..	..	..	..	3	2	..	..	2	1	..	..	2	1	7	4
90-95—Diseases of Circulatory Systems	..	..	..	..	1	..	1	..	..	2	..	..	2	..	1	..	3	1	8	3
106—Bronchitis	..	..	..	..	..	..	2	1	..	1	2	1	2	2	2	3	3	..	11	8
107-109—Pneumonia (All Forms)	2	1	9	8	7	6	21	13	26	15	20	11	47	33	19	21	29	14	180	122
119—Diarrhea and Enteritis	..	..	3	..	1	1	11	4	3	2	4	4	9	5	10	6	4	2	45	24
122 b—Intestinal Obstruction	..	..	..	1	1	..	1	..	1	..	2	1	2	3	..	2	..	4	7	11
129—Peritonitis	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	1	1	2
157 a-d—Congenital Malformations	25	29	36	22	12	11	12	11	13	8	7	3	11	13	7	10	2	2	125	109
158—Congenital Debility	..	..	..	..	2	..	3	1	1	..	..	..	..	1	1	..	..	..	7	2
159—Premature Birth	276	205	100	61	14	11	7	5	5	5	1	..	..	..	..	..	..	..	403	287
160 a&b—Injury at Birth	77	62	59	27	6	2	2	..	3	..	..	..	..	..	..	1	..	..	147	92
161 a-e—Dis. Pec. to Early Infancy	44	20	22	21	3	8	3	1	..	1	2	..	..	..	..	..	..	..	74	51
177-195—Accidental and Violent Deaths	2	1	..	1	..	1	..	1	..	2	1	2	2	6	..	2	2	2	7	18
72—Leukemia	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	1	..	..	2	2
79—Meningitis—Simple	..	..	..	..	1	..	..	..	..	..	..	..	..	1	1	1	..	2	2	4
82 a-d—Cerebral Hemorrhage, Etc.	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	2	1	3
86—Convulsions	..	..	2	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	4	0
87—Diseases of Nervous System	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	..	1	1	2
110—Pleurisy	..	..	..	..	..	..	2	1	1	..	..	..	1	..	2	..	1	..	7	1
115 a1 to b3—Dis. of Buccal Cavity, Etc.	..	..	..	..	..	..	1	..	..	..	..	..	2	..	2	..	2	3	7	3
133 b—Peyelitis	..	..	..	..	1	..	..	..	..	..	..	1	..	..	1	2	1	..	3	3
152—Phlegmon	..	..	..	..	..	..	..	..	1	..	..	..	2	..	1	..	..	..	4	0
153—Diseases of Skin, Annexa, Etc.	..	..	..	..	..	..	1	2	..	..	..	..	1	1	..	..	1	..	3	3
172—Infanticide	7	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	1
ALL OTHERS	1	1	1	1	1	..	3	1	1	1	2	3	3	3	5	2	2	1	19	13
TOTAL	440	326	234	146	55	42	76	42	72	52	53	32	105	75	60	64	63	46	1158	825

The causes of the symptom, convulsions, must be diagnosed better at the present time than formerly; consequently these cases are being thrown over into other groups.

In the beginning I suggested that our table would point the way as to where our future efforts should be applied. About half-way down the table is the group of causes relating to the natal and neonatal period; e.g., Congenital Malformations, Congenital Debility, Premature Birth, Injury at Birth, and Diseases Peculiar to Early Infancy.

If we break our table down into age groups, we find that 68.6% died under one month of age, 62.7% under two weeks, and 38.7% under one day. We, therefore, see that our line of attack has not only been narrowed as to causes of death but in respect to age groups as well. At once we are led to conclude that a principal point of attack is the neonatal causes. Heretofore, our most striking results have been in the saving of lives of infants over one month of age.

These neonatal causes tie us in with the whole problem of maternal welfare, e.g., prenatal and obstetrical care. If the problem of maternal welfare can be solved, we shall have gone a long way toward reducing neonatal deaths. Therefore, we cannot consider any program for further reduction of infant mortality without thinking in terms of maternal welfare. The objectives of a well rounded out maternal and infant welfare program must include adequate prenatal and confinement care for every expectant mother. I can take time only to say that we, as a public health agency, are doing everything we can to educate the mothers of the community to go to their physicians for prenatal care as soon as they suspect they are pregnant, and as regularly thereafter as the physician advises. If a mother cannot afford to have the care of a private physician, she is guided into those channels that provide such care without cost.

The greatest problem in maternal welfare is finding the expectant mothers; e.g., those that would not go to a physician, especially for financial reasons. No one has yet originated an effective finding plan; so far the house to house canvass has been most effective.

Studying Table 1 further, we find that the remaining major causes of infant deaths are (for 1935):

1.	Prematurity	690
2.	Malformations	234
3.	Injuries at Birth	239
4.	Respiratory Causes	359
	Whooping cough	29
	Influenza	9
	Bronchitis	19
	Pneumonia	302
		1522 out of 1983

Which of these causes presents the most practical point of attack? It would be foolish to waste time trying to do anything about malformations; birth accidents and injuries, we hope, will be eliminated through better maternal care; at least be reduced to a minimum.

This leaves us the obvious points, prematurity and respiratory diseases. These are the two points we have stressed during the past two years in our community. It is to the program to reduce the deaths from prematurity that I shall devote the rest of this discussion.

Prematurity. No one has, as yet, defined just what a premature is, but generally speaking, it is an infant that is born before the normal time of gestation, maybe below a certain weight and perhaps of low vitality. Nor does any one know beyond what point it is hopeless to save the premature. At intervals we are impressed with reports of smaller and more premature infants surviving. Hence, it is unsafe to pass over a premature by saying there is no use trying to do anything because it is too small or too premature.

The essential conditions under which the premature has the best chance of surviving are: Warmth, proper nutrition, protection from infection, and medical direction. These things are basic and must be supplied in some way to these infants. Therefore, a program for saving premature infants must include provisions for supplying these things to these babies. In a large metropolitan community this is no small undertaking. It means much planning and cooperation with physicians, agencies and hospitals.

Briefly, the program has been carried out as follows: A group of staff nurses was trained in two of the large premature hospital stations of the city, e.g., Michael Reese and Cook County Hospitals. This training included both hospital and home care of the premature infant. The city was then divided into districts and one of

the trained nurses made responsible for the prematures born in that district.

To conduct a program in the interest of prematures, *births of prematures must be known.* Hence, a regulation was passed which required that a premature birth be reported to the Board of Health at once; the immediate report is made by telephone and this is followed by the usual official report within twenty-four hours. The item "premature" was introduced as No. 6 on the official Certificate of Birth form of the state of Illinois. The baby is referred at once to the premature nurse in that district. The following points determine the future procedure; whether the family can or cannot afford the services of a private physician; whether the baby is born in a hospital or at home. If the case is under the care of a private physician, the nurse communicates with him and is guided by his wishes. If the case is born in a hospital with adequate facilities for its care, she keeps in contact with the hospital so that she will know when the baby is discharged to its home.

As the discussion proceeds, it will be seen that the program is intended to reach especially those premature infants born into an environment unfavorable to their survival.

Complete reporting of prematures is important in another respect. So far there has been no complete report by any community of the prematures born therein. Hence, it has been impossible to know the death rate of prematures. With a complete reporting we shall have statistics on which to base any conclusion as to progress in lowering the death rate of these infants.

The first moments in the life of a premature are the most hazardous; the more so because of the frequent necessity of resorting to some form of resuscitation. Unskilled procedure or the application of wrong methods result in immediate disaster. From the records of the deaths of infants, a study was made of the methods of resuscitation used in various hospitals. Our conclusions were that any method that subjects the infant to any type of trauma is bad; especially immersion in hot and cold water, the various swinging methods, and rough artificial respiration. The use of the tracheal catheter, oxygen, and artificial respiration were the methods most frequently employed; used correctly, they are the methods of choice.

We have undertaken to disseminate through our own staff a rational idea of this procedure so that they, in turn, as they have opportunity, can spread this information to others.

Let us suppose that the infant has survived these first perilous moments of life. We are then faced with the major problem of continually and permanently supplying to him the four necessities of life; e.g., warmth, nutrition, protection against infection, and medical supervision.

Warmth. The ideal place for a premature infant is in a premature station in a hospital; we are fortunate to have in the city three large stations and many smaller ones. However, that all the appliances and equipment of a modern premature station are not available, is no deterrent to carrying out certain workable makeshifts and common sense procedures. There is hardly an essential feature of a premature nursery that cannot be set up even in a poor home.

One would prefer one of the modern incubators of the Hess type, with controlled heat, moisture and oxygen supply. Even the simple Nobel bed, with an electric light bulb for heating is a great advantage but not essential. A very satisfactory heated bed can be improvised with an orange crate and the heat supplied according to local conditions.

However, since we, in the city, have at hand every available modern appliance, we have tried to give as many premature infants as possible the advantage of these things. We usually urge hospital care. In the case of private physicians, these matters are left to his judgment.

A baby is prematurely born at home. Hospital care is indicated and parents and physician are agreeable. How to get it to the hospital without that fatal initial chilling! For transportation we have on call a Hess electrically heated incubator ambulance. Usually the incubator transportation service is requested at the same time that the infant's birth is reported by telephone to the Board of Health. The request is telephoned immediately to the co-operating agency handling the service; e.g., the Chicago Maternity Center; this agency was asked to be responsible because its staff of physicians is on call at all times and is skilled in procedures pertaining to the care of the newborn premature; the taxi bills are paid by the Board of Health, as are the maintenance costs of the am-

bulance. The team, consisting of a physician and nurse, going out on these calls, carries equipment to do transfusions and resuscitations. A small oxygen tank is carried with the ambulance on all runs so that oxygen can be administered to the baby en route if necessary.

However, there are cases that are not sent to the hospital. Hence, conditions must be set up in the home as nearly simulating hospital conditions as possible. As a convenience, the Board of Health has provided a number of heated beds after the Nobel pattern. These are for loaning to those homes where needed. However, many hospitals that have no kind of heated bed have taken advantage of this service; there are also instances where a hospital has an incubator of the Hess type, but it may be occupied and another bed is needed. There is a surprising demand for these beds now that it is known throughout the city that they are available. When a bed is applied for by a physician, one of the premature field nurses goes into the home, sets up the bed and explains to the mother its use.

Nutrition. Provision having been made to keep the infant warm, the next consideration is the baby's nourishment. The food of choice is mother's breast milk. Every effort is made to develop the mother's milk supply so that she can feed her own baby. This is best in every way. No matter how breast milk is produced outside the home, it is going to cost somebody a great deal of money. However, there will always be a few mothers that will not be able to nurse their babies and who cannot afford to buy the milk at any price. Therefore, to take care of these cases a mothers' breast milk station has been established in the Board of Health. This station is distributing on an average of 125 ounces a day. We ask physicians to place the babies who are receiving milk from the Mothers' Breast Milk Station on artificial feedings as soon as the babies' condition warrants the change. This is the only way we can continue to meet the demand. Some form of lactic acid milk is satisfactory as an artificial feeding, but this is largely a matter of chioce and every specialist has his own favorite method.

Because these infants are more prone to develop rickets and anemia than the normal baby, special attention must be given to their prevention. Hence, vitamin D is begun at a somewhat earlier age than ordinarily. Many physicians advocate the use of some form of iron in their treatment, again others maintain that this is of no benefit. Ultraviolet lamps are also helpful.

Protection from Infection. If the baby is cared for in the hospital, this is a fairly easy matter as in a well equipped and well conducted premature nursery this danger is reduced to a minimum and is the first thought in the minds of all attendants.

In the home the situation is more difficult. The intelligence of the mother must be relied on to protect the baby from this danger. It is one of the first duties of the nurse looking after the case to train the mother and family as to the importance of protecting the baby from infection. As nearly as possible the baby is isolated from the family and family activities. Poor home conditions is one of the factors for advising hospitalization, even though the baby itself may be a promising home case. All feeding utensils and everything that goes into the baby's mouth must be sterile. Other material coming in contact with the infant, such as clothing, bed clothing, etc., must be scrupulously clean. Of prime importance is the washing of hands. In fact, if every one attending the baby, and this includes professional attendants as well, washed his hands clean before touching the baby, the safety of the baby would be, in a large measure, assured. It is especially emphasized to the mother that no member of the family or any one from the outside suffering with a cold or any infection must come in contact with the baby. If the mother herself has a cold, she must relinquish the care of the baby to some one else or wear a mask and a gown and be very careful to wash the hands before caring for the infant.

Medical Supervision. The whole plan of this program revolves about medical care. The cases fall into two groups. Those under the care of private physicians and those in indigent families that cannot afford the services of a private physician. The private physician can make as much or as little use of the services offered by the Board of Health as he chooses. On the whole, the physicians have seemed glad to take advantage of the service, especially those who are caring for these infants in the home. Breast milk from the Mothers' Milk Station, heated beds, incubator transportation, and the nurses'

help in the home have all been in great demand.

Medical care for the babies in families that cannot afford the services of a private physician and where the babies are not in a hospital has been a greater problem. It is admitted that the care of the premature requires at least some special understanding and experience. However, with the medical service available through the county physicians, relief physicians and service rendered by our own staff, we have done fairly well so far. When the infants are in condition so that they can be taken to an infant conference, they are referred to one of the special conferences conducted for premature infants. As soon as they reach the status of the well, normal infant, they are referred to the regular infant welfare conference. The premature nurse then discharges the baby to the regular infant welfare nurse.

Perhaps I have not sufficiently emphasized the part of the nurse in this program. After all, she is the most important factor in the whole plan. It is she who keeps constant supervision over these infants in the home. She teaches the mother the proper technic of the care of these infants; keeps the mother in contact with the physician, sees to it that the necessary set-up for the care of the baby is provided; works with the private physician if he has expressed a desire to have her continue on the case. A good nurse is the one feature for which there is no substitute; makeshift nursing would probably be worse than no nursing.

The aim of this discussion has been to sketch in the broadest strokes the means that have been used in a large metropolitan community to solve a problem in infant care. It is an effort to bring to all premature babies the same chance of living as has been given to a selected few that were fortunate enough to have been born in well equipped institutions or to have been taken there soon after birth. Perhaps the highly refined procedure of institutional care cannot be brought to every baby in all sorts of homes; however, since this care is a matter of carrying out certain principles rather than the application of an elaborate technic through complicated appliances, it is felt that the program has certain general interest to all physicians. It is understanding and not apparatus that counts. I believe that all we have done could be carried out in any community no matter how primitive.

THE CLASSIFICATION OF POISONING WITH METHODS OF DIAGNOSIS AND TREATMENT OF SOME OF THE MORE COMMON POISONS

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A poison may be defined as a substance which, when introduced into the body, or absorbed into the blood, is capable by chemical action to affect health or destroy life, and this is its usual effect. A substance which is ordinarily not a poison may become poisonous after the above conditions have been fulfilled. There are various conditions which may modify the action of a poison:

1. Solubility of the substance in water, acids, and also in body fluids, and particularly in lipoids.

2. The rate of absorption, which in turn depends upon a series of factors, such as diffusibility of the substance, its physico-chemical properties, conditions favoring solution or diffusion and systemic conditions.

3. Portal of Entry. Absorption through the stomach is slow, whereas absorption through the respiratory tract occurs much faster. The skin can also absorb poison very rapidly. The author, for instance, has killed rabbits by rubbing wood alcohol to a shaved area on their backs. The genitourinary tract has also been a frequent place of absorption of poisons.

4. Concentration of the poison.

5. The rate of elimination.

6. Individual susceptibility which may be subdivided into an increased susceptibility or idiosyncrasy and a decreased susceptibility, or tolerance.

There are various classifications of poisonings which have been offered, none of them being satisfactory. Poisonings have been classified for statistical purposes as homicidal, suicidal, accidental and undetermined, or they may be classified as to duration, as acute, subacute and chronic, or as to their action as corrosives, irritants and neurotics. In this present paper the author has attempted to classify poisonings according to the conditions under which they occur.

I. *Intentional Poisonings.* This group in-

cludes primarily cases of suicides. Several substances have been chosen by the public at large for suicidal purposes and poisons of choice are those which are easily obtainable and cheap, and believed to be effective.

In this country carbon monoxide poisoning is quite common. The poisonous gas is usually inhaled from fuel gas supplied to the home or from the exhaust of an automobile in the garage. The gas escapes from the exhaust while the motor is running. In 1935, 46 out of 74 carbon monoxide poisonings in Cook County, Illinois, were due to automobile exhaust gas.

Other poisons which have been used with suicidal intent are bichloride of mercury, carbolic acid, quinine, potassium cyanide, oxalic acid, mineral acids and alkalies, sodium fluoride, and strychnine.

The group of intentional poisonings includes also homicidal poisonings. The most common poisons used for this purpose are arsenic and strychnine. The four most important motives for homicide are financial gain, love or passion, hatred and revenge. Murder by poison is still being resorted to in spite of the great progress in toxicological investigation. Arsenic is commonly given in divided doses, or may be used in smaller doses over a longer period of time and then one large dose administered to hasten the end. The Baker case may be given as an illustration. In this case the arsenic was administered over a period of six weeks, then finally one large dose was given which caused Baker's death.

In this subgroup belong also cases of infliction of injury. Sulphuric acid is used comparatively often in passional crimes for the purpose of marring.

Poisonings have also occurred in cases of criminal abortion, where the poison had been either procured or administered by some other person. Several substances have been used as abortifacients. The most common ones being quinine, ergot and cotton-root bark. In certain small communities in Germany, drastic substances such as sulphuric acid have been used. Other substances used for the same purpose are apiol capsules, certain lead compounds, nitrobenzol, potassium chlorate, thuja, oil of savin, and oleandrum leaves.

2. *Unintentional Poisoning.* These poisonings are due most commonly to the exposure of workmen to noxious substances and gases. They may be considered accidental, yet the manufacturer is held liable under the "Workmen's Occupational Diseases Act." The discussion of this rather practical phase of the subject would occupy more space than the author intends to devote to this paper, therefore only a few of the most important types of poisonings shall be mentioned. These include in the order of their importance the following:

Lead poisoning has been known for centuries, even by the early Greek and Roman physicians, and it was Hippocrates who first incriminated lead as the cause of certain symptoms. Industrially, lead poisoning occurs chiefly in the manufacture of lead pigments, battery plates, painting, plumbing, printing trades, glazing china and porcelain ware, covering cables, bearing metals, smelting and refining of lead, and in any industry that uses lead in the process of its manufacture. Poisonings are also frequent in automobile industry, where solder is used on automobile bodies. In this connection, it is interesting to mention that the negro race seems to be more susceptible to lead poisoning than the white race.

Cadmium is a metal which also has industrial-toxicological importance. Industrially, the greatest danger of cadmium poisoning is found in the manufacture of this metal and in the handling of its compounds. The workman is usually exposed to the fumes and vapors which escape from the condensers of the blue powder furnaces, in the making of cadmium and cadmium oxide. This poison enters the body most commonly through the gastrointestinal tract. Three cases of poisoning have been reported in workers in paint factories, where ingots of cadmium were melted. (Legge, T. M., Ann. Rep. Chief Inspect. Factories, 1923; London, 74: 1924.)

Chromium is also of importance as an industrial poison. It is now being used extensively in plating of metalware. The chromates of sodium, potassium and ammonium are used as mordants in dyeing and in the quick method of tanning leather. Chromates are used in the manufacture of paper, wall paper, aniline dyes, explosives, electric batteries, artificial flowers, bleaching oils and fats, textile printing and in paints. Potassium bichromate is used in the manufacture of battery fluids. The derivatives of chromic acid

are decidedly toxic and a series of severe poisonings with fatal outcomes have been reported. Dichromate solution when brought in contact with the skin gives rise to an ulcerative dermatitis and this can be observed generally among photographers and blue print makers. In the plating industry, perforation of the nasal septum may occur.

Chronic manganese poisoning is much more common than had been thought in the past. The author recently presented a case with a review of the literature of industrial manganese poisoning. (McNally, W. D., Industrial Medicine, 4:581, 1935.) It occurs in brown ore millers who are handling manganiferous ores and are exposed to manganese dioxide dust. At present, it is most frequently observed among workers in the dry battery cell industry. The clinical picture bears much resemblance to Parkinsonism, and includes disturbances in gait, mask-like stolid face, speech disturbances and tremors. Up to the present time there have been reported altogether 142 cases of chronic manganese poisoning in the literature.

Industrial arsenical poisoning is of a certain importance inasmuch as arsenic trioxide is used to decolorize clarified glass, for the bronzing of metals and in the form of lead arsenite for the preparation of white enamel. It is also used for the preservation of skins, furs, and rugs. Sodium arsenite and other arsenical preparations are used as mordants in cotton printing; in the manufacture of various insecticides, such as Schweinfurt's green, and lead arsenate.

Arsine intoxication is of a relatively frequent occurrence. This gas is often present in air as a result of the action of acids upon metals such as iron, zinc, copper and cadmium containing arsenic. The author has found it in air during the pickling of iron and steel. Multiple neuritis has been reported from the inhalation of this poisonous gas generated in this process. Cases of arsine poisoning having been reported comparatively often in the production of zinc salts, and in chemical factories from the cleaning of the acid residue in tanks. The gas has a strong hemolytic action and jaundice usually develops in the victims from the formation of an excess of bile pigment, from the liberated hemoglobin.

Cyanides are used extensively by photographers and electroplaters. They are easily obtained by the laity. Poisonings have been reported from its indiscriminate use in the cleaning of silverware.

Space will not permit to discuss in detail all of the types of industrial poisons. Only the most important ones shall be briefly mentioned here. These include carbon monoxide, hydrogen sulphide, sulphur dioxide and ammonia and mercury poisoning.

Among the organic solvents of industrial-toxicological importance are benzol, toluol, xylol, benzine, methyl alcohol and some of its homologues, particularly butyl alcohol, carbon tetrachloride, trichlorethylene, butyl acetate, and a host of other less known organic solvents.

The fluorides present in minerals and ores are also important because of their chemical interaction with silica in producing fibrotic changes in the lung. (McNally, Wm. D., J. Ind. Hyg., 1935.)

Home Poisoning. This group includes poisonings which occur in the home as the result of a mistake, carelessness or ignorance. Oxalic acid poisoning oftentimes results from the ingestion of the contents of unlabeled or erroneously labeled bottles. Accidents have occurred in homes where bottles containing oxalic acid have remained unlabeled after some of it had been used for the removal of ink stains from linen. Oxalic acid is easily confused with Epsom salts, to which it bears a close resemblance.

Several cases of poisoning have also been recorded as the result of carelessness in handling and disposing of medicinals. Children may inadvertently swallow with fatal results substances such as Hinkle pills, mistaking them for candy.

Decoctions of tobacco are sometimes used as insecticides in the country. These decoctions are oftentimes kept carelessly in unlabeled whiskey bottles and may be ingested by accident. Acute nicotine poisoning results and death occurs very rapidly.

In homes, carbon monoxide is generated as the result of incomplete combustion in defective stoves. Other sources are low burning oil lamps, Bunsen burners, etc. The Bunsen burner is particularly dangerous because it may ignite at the base whereby considerable quantities of the poisonous gas are produced. Stove pipes passing through the walls may be leaking and cause carbon monoxide poisoning in a room at some distance from the source. In the past, carbon

monoxide intoxications due to illuminating gas had been very frequent, but the number of deaths in the last few years has been steadily diminishing, due in part to the substitution of electricity as a means of illumination, and also to the use of service gas which at present contains only 3% carbon monoxide. Exposure to an atmosphere contaminated with this gas may cause serious illness. If the concentration of the carbon monoxide is as low as 0.1%, headache and vomiting result in a few hours. Carbon monoxide may act very rapidly and cases have been reported in which the victim after a single breath of air containing a high concentration of the gas fell suddenly backward as though struck by lightning. In the majority of cases, victims of carbon monoxide poisoning in the home are either found dead or die shortly after discovery.

Another source of poisoning in the home is the refrigerating gas, and the danger increases rapidly in proportion to the amount of the chemical used and the manner in which it is distributed. The three most important refrigerating gases are sulphur dioxide, methyl chloride and ammonia. Poisoning by methyl chloride is listed in text-books of toxicology as being rare, but the author has observed 98 cases. On August 10, 1928, I saw the first case of methyl chloride poisoning in which three people lost their lives. The first symptoms are drowsiness, nausea, vomiting, headache and a feeling of fatigue. There may be some dyspnea and a tranistory diminution of vision. The blood picture nearly always shows a condition suggestive of primary anemia.

There is little danger from sulphur dioxide poisoning because the gas is so irritating to the respiratory passages that the victim usually becomes aware at once of its presence. Death from asphyxia results only when the concentration is very high and the victim cannot retire from the fumes fast enough.

Ammonia is used often in large refrigerating units. If the concentration of the escaping gas is very high death may occur in a few minutes. The result is a general vasoconstriction and a tachypnea. Respiration may stop suddenly. In the home ammonia water is often used for cleaning purposes. Accidental and suicidal cases have been reported from the drinking of ammonia water.

In the past few years of depression discarded storage battery casings have been used in homes for fuel. The inhalation of lead fumes derived from this material has given rise to a number of poisonings. In November, 1935, several children of one family were brought to the Cook County Hospital. Two children died of an encephalitis in spite of an attempted subtemporal decompression. The casings used had been obtained either at a very low cost from the junk dealer or were found discarded.

Lead poisoning in homes has also occurred in connection with drinking water. In newly constructed houses the lead content of drinking water may amount to 5.3 mg. per liter in the morning, and 3.5 mg. per liter during the day. Fairley (Fairley, K. D.: Med. Jour. of Australia, 1: 600, 1934) has observed cases of poisoning occurring in infants who were poisoned from the use of toilet water containing lead. A number of lead poisoning cases occur also in small infants who chew on the framework of their cribs, and from toys and wood-work painted with lead-containing paints. Infants also have been poisoned by lead-containing face powder used by the nursing mothers. The usual symptoms in such cases were delayed teething, nervous symptoms such as convulsions, twitching and paralysis, diarrhea and constipation. Blood smears show the presence of basophilic stippling.

Cases of lead poisoning have been reported in the homes as the result of the ingestion of lead arsenate used commonly as an insecticide. Several cases of arsenic intoxication in the home have occurred from the ingestion of Paris green.

Another common source of home poisoning are the fluorides and silicofluorides which are commonly used as roach powders. The symptoms are vomiting, diarrhea, salivation, labored breathing, spasms, cyanosis and a small rapid pulse. Death usually occurs within eight hours.

Other poisonings include those which result from the indiscriminate use of hypnotics of the barbituric acid series (veronal, luminal, amytal, etc.).

A number of deaths have been traced to various solvents used in the home such as benzol, benzene carbon tetrachloride, trichlorethylene, naphtha, etc.

Sporadic cases of botulinus infection still occur in connection with the ingestion of improperly canned food. B. botulinus is a spore

forming anaerobic bacillus which produces a highly poisonous toxin. It has been responsible for a number of cases of food poisoning.

Occasionally there occur poisonings in the home as the result of the ingestion of bichloride of mercury tablets and other mercurial preparations which are taken either through carelessness or by mistake.

Home poisoning may result also from the ingestion by children, of thorn apples (stramonium) or from the ingestion of mushrooms which have been picked in the fields or woods and were believed to be non-poisonous. Many cases of dermatitis occur from the use of cosmetics (face powders, eyebrow pencils, lotions) to which the patient may be particularly sensitized. Cases of dermatitis result also from furs which have been freshly dyed and from flowers, especially from primroses. A few cases of thallium poisoning have been observed from its use as a depilatory.

Medicinal Poisoning. Medicinal poisoning may be due chiefly to three causes: 1. To errors occurring in the physician's prescription. 2. To errors arising during the filling of a prescription. 3. To indiscriminate self-medication. The following example may be given: A physician's erroneous prescription read soluble barium instead of insoluble barium for x-ray examination; the same mistake was made by the pharmacist who filled this prescription. Again, physicians may erroneously prescribe alkalies with alkaloidal salts causing a precipitate of the alkaloid, which might be taken in the last dose of the bottle, with fatal consequences. Mistakes may also occur by prescribing an overdose. Cases have occurred in which the physician prescribed 1/20 grain of aconitine instead of 1/400 grain. Oftentimes poisonings result from careless and inaccurate directions to the patient. Arsenicals taken in this manner over a long period of time have given rise to polyneuritis, exfoliative dermatitis and other skin lesions. Mistakes on the part of the pharmacist may occur as in the case cited above. A well known pharmacy three years ago dispensed by mistake mercuric chloride in place of calomel. On the part of the patient poisoning may occur following the indiscriminate use of drugs which the patient sometimes procures himself, and in a large number of cases the patient in order to obtain quicker and better results consumes larger doses of medicine than those prescribed by the physician. Self-medication is very common, particularly in reference to women who want to lose weight. They use substances such as dinitrophenol and thyroid extract. Sometimes similar substances are procured either by incompetent third persons or through advertisement in non-official publications. Several cases have been reported by the indiscriminate use of oil of chenopodium, carbon tetrachloride, santonin and other anthelminthics. A number of persons suffering from gout have poisoned themselves inadvertently with atophan which has given rise to fatal hepatitis. Poisonings also occur from self-medication in the treatment of lues, with arsenic, mercury and antimony. Mercurial poisonings have often resulted in connection with amalgam fillings of teeth. Poisonings with thallium or barium used as a depilatory or in the treatment of mycoses have been relatively frequent. Iodide poisonings have resulted in connection with its use as a contrast substance in bronchography.

Nervous persons suffering from worry and insomnia have often been the victims of barbituric acid derivatives, of which they had taken an overdosage in order to secure more rest.

There is finally a group of poisonings which occur as the result of individual susceptibility to drugs, such as antipyrine, arsphenamine, iodine, salicylic acid, potassium chlorate and amidopyrine. Under this heading the author will also include those cases of chronic poisonings which result from medicinal use. Morphine cocaine, trichlorethylene, chloral hydrate, chloroform, alcohol and a few other substances are known to bring about a craving in persons who overindulge in their use. Morphine, cocaine and alcohol are particularly apt to give rise to addiction.

Morphine is usually taken hypodermically by the addict. The effects of the prolonged use of any of these drugs are characterized by a complete breakdown of moral, mental and physical character of the addict. In cocaine addiction, the individual usually snuffs a small amount of the crystals. This is known to the addict as "snow." At first, the effect is generally that of elation and increased physical strength. The habitue develops an idea of grandeur, but with the prolonged use of this alkaloid, as time goes on, he deteriorates mentally.

Having presented this classification of the

most common poisons as they have presented themselves to the toxicologist, the author desires to discuss the diagnosis and treatment of some of the more common poisons.

The diagnosis of poisons is many times easy, sometimes difficult and occasionally impossible, with the facilities at our disposal. A proper diagnosis is of the utmost importance so that appropriate treatment may be instituted. According to Zangger (Zangger, H., Diagnostiche und therapeutische Irrtumer und deren Verhutung. Leipzig, 1924) 80% of all cases of poisoning are not diagnosed in medical practice. This figure, I believe, is too high for American physicians. Nevertheless, there is room for great improvement in our percentage of accurate diagnosis.

Why is it impossible to make a diagnosis in every case? First, because there are too many new drugs and chemicals introduced each year to our long and over burdened list of therapeutic measures. It is impossible for us because of lack of time and training to study the pharmacology and therapeutic action of these drugs and to acquaint ourselves with the possible toxic action. However, it is possible knowing the chemical composition of some of the members of a certain group to prophesy what the physiological action probably will be for new compounds of that group. From the study of barbital (diethylbarbituric acid) we can tell with reasonable certainty how to treat the toxic action of the new compounds that are formed upon the barbituric acid base. Space will not permit a discussion of the relation between the chemical constitution and toxicological action.

Secondly, the task of diagnosis is made difficulty because of the paucity of the knowledge of poisons among doctors. This lack of information regarding poisons is in part due to the failure of the medical colleges to lay more stress upon the teaching of materia medica and toxicology. In arriving at a diagnosis of poisoning the careful history is a prerequisite as in the diagnosis of disease. A history may be given which is entirely misleading. Several years ago a physician asked me to see, in consultation, a case of alcoholism, which on investigation turned out to be a famous case of arsenical poisoning.

A suspicion of an acute poisoning should be entertained if any individual who had been previously in good health suddenly become ill with the symptoms rapidly increasing in severity. This suspicion always become increased if the symptoms appeared a short time after partaking of food, drink, or medicine. If the symptoms agree with those of a group of poisons and can be differentiated from a disease our suspicion becomes firmly fixed. However, it must be kept in mind that certain diseases closely simulate certain poisons. The irritant poisons may be simulated by gastroenteritis, gastric and intestinal ulcers, acute indigestion, appendicitis, intestinal obstruction and peritonitis. Narcotic poisonings may be simulated by epilepsy, apoplexy, cerebral hemorrhage, certain heart diseases, inflammation of the cerebral spinal system, uremia, etc. In acute poisoning a careful examination will many times enable a physician to make an immediate diagnosis. The color of the face, if of a deep pink or red, would lead one to suspect the presence of carbon monoxide or cyanide. Evidence of corrosion on the lips, tongue, mouth and throat would lead one to suspect that a corrosive poison had been taken. The odor of the breath will ofttimes give important clues, showing that cyanide, phenols, alcohol, chloroform and other odoriferous substances have been taken.

The examination of the vomitus will often reveal important evidence. It will sometimes show whole pills, tablets, parts of powder, crystalline substances, and the odor will reveal substances such as nitrobenzine, cyanide, lysol, phenol; the color will indicate whether Paris green or Rough-on-Rats had been taken. The vomitus, urine and feces should always be saved in a suspected poisoning for a chemical examination as the case may be of such a character as to be presented before a jury. The examination of the urine (Kobert, R.: Kompendium der toxikologie: 1912-34*) will frequently aid in the diagnosis. A few urinary findings are given in Table 1.

When one's suspicion has been confirmed of an acute case of poisoning one should look around for sources of that poisoning. A glass may have been left on a dresser containing remnants of poison, tablets, pills, or powders, which may give one a clue as to what had been taken. Smell of any suspected substance with care; taste cautiously of a very minute particle of the suspected substance.

The only way to be certain of the diagnosis

TABLE 1

1. Reaction very acid.	Mineral acids, acid metallic salts.
2. Reaction strongly alkaline.	Corrosive alkali, sodium carbonate, salts of organic acids (except oxalic acid).
3. Violet odor.	Turpentine and other ethereal oils.
4. Garlic odor.	Tellurium or bismuth preparations containing tellurium.
5. Odor of ammonia.	Catarrh of the bladder poisoning through strong bases.
6. Yellow to deep red.	Picrates, picric acid, serenium, pyridium, acriflavin.
7. Red in color after addition of sodium hydroxide (to be free of blood pigments)	Phenolophthalein, senna leaves, cascara, sagrada, hematoxylin, fuchsin, pyramidol, and antipyrine.
8. Port wine color through hematoporphyrine.	Sulphonal, trional, chronic lead, tetronal.
9. Urine contains conjugated sulphates.	Phenol, creosol, lysol, resorcin, creosote, guaiacol, aniline, paramidophenol, acetanilid, phenacetine.
10. Urine contains leucin and tyrosin.	Phosphorus, acute yellow atrophy of liver, pellagra.
11. Small drop of urine causing tetanus in frog or small mouse.	Strychnine.
12. A small drop of urine in cat's eye causing dilation of pupil.	Atropine, hyposcyamine, scopolamine, cocaine, tropacocaine.

is to have a chemical examination made of the vomitus, medicine or food. For most of the poisons this would take considerable time. In the case of arsenic and mercury we have the quick and reliable Reinsch test.

The Reinsch test is simple and can be run in any physician's office where gas is available. The test consists in boiling a sample of the vomitus, urine, stool or suspected food in a beaker or evaporating dish with a strip of copper foil, 1¼ inches long by ⅛ inch wide and 25 cc. of C. P. hydrochloric acid. If the material is solid, water must be added to liquefy the specimen under examination. In the case of urine, 500 cc. at least must be evaporated down to 75 cc.; usually about one ounce of solid material is sufficient. After boiling, the supernatant liquid is decanted, the foil washed with water, alcohol and ether and placed in the long end of a prepared small glass tube as shown in the illustration:

This glass tube is made from a piece of tubing ⅜ by 6 inches long. Capillary constriction is drawn so that the long portion of the tube is 3½ inches, the capillary about ¾ of an inch in length, and the short end of the tube is 1½ to 2 inches. The copper foil is placed in the long arm of the tube, and capillary refrigerated by a strip of filter paper dipped in cold water. The finger tip is held over the opening in the long portion of the tube and heat applied beneath the copper strip. Arsenic is deposited as octahedral crystals. Mercury is deposited as small silvery globules which can be easily seen under the microscope. Controls can be run with known specimens of arsenic and mercury.

Every type of poisoning requires a specific treatment. However, as this particular poison may not have been identified at the time of the examination of the patient, certain general rules can be followed in the treatment. These are 1. removal of the poison, 2. administration of antidotes, 3. symptomatic treatment.

1st. Wash out the stomach with plain water or with water containing one teaspoonful of baking soda to the pint unless an alkali had been taken. If a stomach pump is not handy give copper sulphate gr. V or zinc sulphate gr. XV or a hypodermic of 1/10 gr. of apomorphine.

2nd. Removal of poisons by enema.

3rd. Immobilize the parts by tourniquet as in bites of snakes or animals to prevent absorption.

4th. Shaeffer method of resuscitation when respiration is failing or if in hospital give oxygen with 5% carbon dioxide.

5th. Intubation or tracheotomy where unable to swallow or breathe as in case of acids, alkali or bichloride of mercury.

6th. Cold compresses to head and sponging of body until temperature is normal.

7th. Induction of sweating tends to remove some poisons.

Fig 1. McNally tube for Reinsch test.

8th. Passive massage of limbs to improve circulation.

9th. Give gelatinous drinks in cases of alkali poisoning.

10th. Pieces of ice to hold in mouth in alkali poisoning.

11th. Catheterize urinary bladder in case of morphine poisoning to prevent reabsorption of the alkaloid and also for chemical examination.

12th. Dilution of poison in the blood by hypodermoclysis using Fisher's solution or normal saline.

In case the poison is known give the appropriate antidote; otherwise use a general antidote composed of magnesium oxide two parts, and one part each of activated charcoal, tannic acid and alcresta (purified Fuller's earth). The mixture may be given in doses of a heaping teaspoonful stirred up with water or milk and can be repeated several times if necessary. The stomach should be washed out after each dose.

The treatment of poisoning may be briefly summarized by stating that the first step should be the removal of the poison from the stomach. Secondly, administration of appropriate chemical or mechanical antidotes. Under the chemical antidote we usually have another chemical either neutralizing the first poison or detoxifying it by forming an insoluble compound. Thus in the case of a corrosive alkali we would neutralize the effect of the alkali by adding a weak acid such as vinegar or lemon juice.

Use caution in the selection of an antidote. It should be nearly harmless so that if given in excess will do little or no damage. (Peterson, Haines, Webster, 2: 31, 1923.) The weak acids mentioned would be preferable to using sulphuric acid. If a soluble barium salt had been taken we would render it insoluble by the administration of a soluble sulphate as magnesium sulphate to precipitate the harmless barium sulphate.

Under mechanical antidotes are those substances that reduce the absorption of the poison by enveloping it with a coating of oil or fat or the whites of eggs. The stomach walls covered by the administration of any of these substances also prevent the absorption of the poison until removed. The effects of the poison can be altered by the use of "physiological antidotes," as in the treatment of strychnine poisoning, by the use of chloral hydrate, chloroform, or barbiturates.

The poison can be eliminated by the use of diuretics, cathartics, enemas, and hot packs. Many poisons are eliminated through the kidneys and large drafts of water should be administered after the removal of the poison from the stomach, and potassium acetate, caffein, digitalis, theobromine, or other diuretics alministered unless contraindicated. Hot packs over the abdomen and over the region of the kidneys will increase their activity when they are congested by the poison. If the patient is unable to void naturally, the bladder should be emptied by a catheter. As most cathartics are too slow in action, the bowel should be emptied by means of soap suds enemas or plain water. In certain poisons it will be found of value to increase the activity of the skin by the use of a hypodermic injection of pilocarpin.

By the dilution of the poison in the blood and favoring the action of the organs, elimination can be accomplished by the hypodermic injection of normal salt solution (hypodermocylsis) into the breast. Where it is not possible to set up an apparatus for hypodermoclysis, a saline solution can be administered as a retention enema in the lower bowel (enteroclysis).

Where there is considerable pain anodynes can be administered. In cardiac trouble give strychnine, digitalis, camphorated oil, caffeine and caffeine sodiobenzoate. Chloral or chloroform can be given to control convulsions if they are not due to methyl chloride or to other poisons of this series. Patients should be given the best nursing service possible and visitors kept out of the room until all danger is past. Electric pads and hot water bottles may be applied to the body or the exttremities in case of coldness or chills.

In the space allotted to this article it is possible to take into consideration only a few of the common poisons. The first one the author will take up is carbon monoxide.

CARBON MONOXIDE

Carbon monoxide is one of the most important poisons associated with human life and industry. The death rate of this poison is exceeded by only one other poison, grain alcohol. As carbon monoxide is the result of the incomplete combustion of carbon, man came in con-

tact with the most subtle of poisons with the kindling of his first fire. The effects of carbon monoxide were known in antiquity. Some of the symptoms of carbon monoxide were known nearly 300 years B. C., as Aristotle observed that "men suffered from heaviness of the head and often die from coal gas." Most of the deaths in recent years have been due largely to the more extended use of artificial gas as a source of heat and power, also to the rapidly increasing use of the internal combustion engine whose exhaust always contains carbon monoxide. In localities where natural gas is being used with a small amount of other gas, the carbon monoxide content of the commercial gas has been reduced to about 3 per cent. This, as noted in the table below, has caused a steady drop in deaths in the last two years.

TABLE 2

DEATHS DUE TO CARBON MONOXIDE IN COOK COUNTY, ILLINOIS

1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
470	479	518	386	237	214	361	412	320	403	375

1928	1929	1930	1931	1932	1933	1934	1935
398	237	310	304	188	128	143	74

Carbon monoxide when pure is nearly insoluble in water, colorless, tasteless and a practically odorless gas, this latter physical property making it dangerous as a source of poisoning. The density compared to air is 0.967.[2] It can be compressed into liquid and a solid. It has a coefficient of solubility of 0.0243 at 15° C.

Carbon monoxide is produced at the electrodes or from the charges of electric furnaces. In electric furnaces having limestone linings the carbon dioxide is reduced to carbon monoxide at the heated electrodes; the gas escapes unburned, producing characteristic symptoms. The most common sources of carbon monoxide, with the exception of its marked formation during a severe lightning storm, are stoves, grates, salamanders, domestic and industrial furnaces, distillation of oil, gas engines, fumes from explosions, burning x-ray films, smouldering ashes, and mine coal, natural and artificial gases. It is formed whenever incomplete combustion of carbon occurs, such as flames on besooted surfaces and low burning oil lamps. Using intermittent aspirator to imitate the smoking of tobacco, I found that the carbon monoxide from the inhaled smoke from cigarettes was from 0.1 to 0.26% of the tobacco and paper consumed, from cigars 0.027 to 0.15% and from pipe tobacco 0.27%.[3]

The greatest percentage of carbon monoxide asphyxiation is through tht medium of illuminating gas, which has the characteristic odor of the hydrocarbons accompanying the gas. This familiar odor does not prevent many accidental poisonings as the odor may not be perceived by those in deep sleep, or by a person with a defective sense of smell.

Carbon monoxide may be freely respired as its presence in air is not manifested by either irritation to the air passages or by its affecting the sense of smell as is noted with sulphur dioxide gas used in mechanical refrigeration. However, the moment carbon monoxide comes in contact with the blood, by diffusion, its unites with the red pigment of the blood corpuscles, forming a definite compound, carbon monoxide hemoglobin exactly replacing the oxygen volume for volume. According to research of Nicloux (Nicloux: Presse Med. 25: 153, 1916, Ibid. 29: 701, 1921) one volume of carbon monoxide acts like 220 volumes of oxygen. The corpuscles are not dead. All that the blood needs is oxygen under sufficient tension to dispace the carbon monoxide. Hill and Barcroft (Hill and Barcroft: Biochem. Jour., 7: 471, 1914; Ibid., 48-491) have shown that carbon monoxide enters into combination more readily when a little oxygen is present, than when it is completely absent.

Haldane (Biochem. Jour., 13: 44, 275, 1912) believes that all the effects of carbon monoxide can be referred to lack of oxygen, the symptoms increasing with the saturation of the blood. Mice were kept alive on exposure of 200 to 300 times the fatal dose of carbon monoxide in the presence of oxygen under 1 or 2 atmospheres of pressure. Haggard (Am. J. Physiol, 56: 390, 1921) maintains that there is no direct toxic action of carbon monoxide on the heart; for if respiratory failure is prevented by means of administration of 8 to 10% carbon dioxide, the CO combination with the hemoglobin may rise to an unusually high percentage without any evidence of impairment of the heart function. Death in cases of carbon monoxide asphyxia is due to the failure of respiration, of the nature of a fatal apnea vera. Haggard further states

that the lack of oxygen resulting from the formation of CO hemoglobin induces excessive breathing which in turn results in an abnormal loss of carbon dioxide followed by failure of respiration. The increasing anoxyemia from this cause speedily results in the development of heart block through its various states.

Regardless of what may be the belief as to the nature of CO poisoning (McNally, W. D., Ill. M. J., 59: 383-388, 1931) whether CO causes only a simple asphyxia or is a toxic agent, it is well recognized that where carbon monoxide has been inhaled for a considerable time the damage done to the nervous tissue, especially the vital nerve centers, is very serious. Some observers declare that carbon monoxide exercises a specific action upon the nervous mechanism of the heart which has been attributed to its specificity for the nerve centers.

The period of time during which the presence of carbon monoxide may be detected in the blood does not depend alone upon the duration of the period of exposure or its intensity, but upon individual peculiarities as well. In most cases, howver, the length of time during which CO may be detected depends largely upon the period of exposure.

The symptoms may simulate many other conditions. The reason for this is chiefly in the rate of absorption and the extent of the combination of the hemoglobin with the gas. When the volume of breathing is increased by muscular exertion the absorption of gas is proportionally increased. The smaller or younger the individual the quicker is the saturation of the blood by carbon monoxide. In the resting stage the volume of breathing varies between individuals as a function of the surface area of their bodies. Small individuals succumb to carbon monoxide more rapidly than large individuals, for the volume of their respiration is greater in relation to the volume of their blood. This fact is made of practical use in the examination of the air of mines when mice or canaries are carried into the vitiated air as living signals of dangerous amounts of gas. Men breathing the same atmosphere have about twenty times as long a stay in the contaminated air as the small animals before getting into a like condition, as men have one-twentieth the skin surface of the small animal per unit of body weight.

TABLE 3

PERCENTAGE SATURATION OF THE BLOOD WITH CARBON MONOXIDE AND CORRESPONDING PHYSIOLOGICAL EFFECTS

Per cent of hemoglobin in combination with CO	Physiological effect
10	No appreciable effect except shortness of breath on vigorous muscular exertion.
20	No appreciable effect in most cases except short wind even on moderate exertion; slight headache in some cases.
30	Decided headache; irritable; easily fatigued; judgment disturbed.
40-50	Headache, confusion, collapse and fainting on exertion.
60-70	Unconsciousness; respiratory failure and death if exposure is long continued.
80	Rapidly fatal.
Over 80	Immediately fatal.

The onset of symptoms may be sudden, but usually there are warning sensations as headache, throbbing of the temples, ringing in the ears, faintness, dizziness and vomiting. The face becomes red, and there is loss of memory, vertigo, fainting, anesthesia and loss of all spontaneous power of movement. The heart action is at first violent, then weak, slow and arrested. The body temperature is lowered. Recovery is sometimes rapid. As a rule, however, there is a slow return of consciousness with more or less prolonged headache and nausea. When the gas itself does not kill, apoplexy or softening of the brain may follow.

In the acute stage, a diagnosis of food poisoning, strychnine poisoning, diabetes and alcoholism has been made in cases of carbon monoxide poisoning. In fact the symptoms are so varied that a physician is reminded of disease of the brain, spinal cord, lungs, kidneys, liver and skin. As many cases have persistent vomiting, a few have convulsions, some are in a coma, a few have delirium, and 20% have glycosuria, a faulty diagnosis cannot always be criticized.

Chronic poisoning by carbon monoxide has received the attention of many observers in recent years. There is very good evidence of this form. Accumulated cases show that it is the result of being in a constantly contaminated atmosphere. The symptoms are described as an alteration in the digestion, diminished vigor, gray color of the skin, coated tongue, loss of memory, diminution of the psychic powers and occasional convulsions. The pathologic findings at autopsies have shown, in some cases, fatty degeneration; in others, pernicious anemia.

Haines, Karasek and Apfelbach (Haines, Karasek and Apfelbach: Report of (Illinois) Commission on Occupational Diseases, 89: 1911) in their investigation of the effects of carbon monoxide, found that workmen exposed frequently to the gas in metallurgical establishments, in a large majority of cases, developed a considerable increase of red corpuscles above the normal, the number in one case examined reaching 9,000,000. The amount of hemoglobin was also usually above normal. These investigators attribute the increase in red cells and hemoglobin to a protective effect on the part of the system.

Treatment: This consists in taking the person at once out of the poisonous atmosphere into fresh air and in inducing artificial respiration as rapidly as possible; the giving of oxygen under slight pressure, enough to distend the cheeks, and compressing the lungs, is considered one of the most efficient methods of restoring the person to life. The elimination can be hastened by the inhalation of oxygen and carbon dioxide, 5%. Methylene blue is not an antidote but has a synergistic action.

MERCURY

The diagnosis of acute mercurial poisoning is made easy by the use of the above mentioned Reinsch test; this test does not distinguish between the administration of mercuric and mercurous salts. Bichloride of mercury is easily obtained in the form of tablets for use as a disinfectant colored by indigo, methylene blue or other dye. There is no odor but an acrid metallic taste. It is soluble in 16 parts of cold water, and three parts of boiling water, but is far more soluble in a solution of common salt or other alkaline chlorides. A fatal poisoning has occurred in swallowing by mistake, a tablet of corrosive sublimate for one of aspirin; also from the introduction of the tablet into the vagina for the purpose of inducing abortion. Children have mistaken bichloride of mercury tablets for candy with fatal results. Another common source of acute poisoning is the swallowing of powder and tablets for the purpose of committing suicide.

Symptoms: When taken by mouth the symptoms usually appear within a few minutes. There is a strong metallic taste, constriction in the throat, retching and a burning sensation in the gullet and stomach. A white coating forms at once on the shriveled lining of the mouth, the inflammation of the throat may involve the larynx, and acute swelling of the glottis may caues asphyxia. The pain in the stomach is so severe as to cause fainting. Vomiting may occur within five minutes, and later on purging and straining with bloody stools and there may be hemorrhages from the mouth, stomach and bowels. I have seen mucous patches discharged from the bowel as large as one's hand. The urine is scanty and suppressed, the temperature may be febrile or subnormal, the respiration difficult, the pulse thready and irregular. Death is preceded by collapse, unconsciousness, or convulsions. We find a decrease in the chlorine content of the blood, decrease of the alkaline reserve owing to acidosis. The blood chemistry is a valuable aid in the treatment to show the progress being made in the treatment. The normal NPN per 100 cc. of blood is 25 to 35 mg. In mercurial poisoning we see this jump from in the eighties on the third day to over 200 on the tenth day. This is a bad prognosis as the patient usually dies. However, if the non-protein-nitrogen starts to go down after the 7th day you can be sure that this patient is going to recover. The urea nitrogen normally is from 12 to 14. This may suddenly increase on the third day to 70 mg., to over 170 on the tenth day in bad cases. In fact all of the constituents, the Urea-N, Ammonia and Amino-N, Uric acid N, and Creatinine-N of the blood increase nearly double.

Treatment: In all cases seen within an hour the whites of two eggs in a pint of milk should be given per mouth and aspirated in five minutes. (Skimmed milk should be used as all fats dissolve mercury salts and aid in their absorption.) Before leaving the office telephone the patient and instruct him to take the milk and induce vomiting without delay or have relatives forcibly give milk in case of attempted suicide. A second portion of milk and eggs should be given, allowed to remain for ten minutes, and then pumped out. While waiting, one-half gram of sodium thiosulphate should be given intravenously, repeated in ten hours, giving thereafter two doses every twenty-four hours, for a period of four or five days. After the aspiration of the second pint of milk, wash out the stomach every four hours with a quart of water containing 8 grains of calcium sulphide. Colonic flushing of

one gallon of water should be given every eight hours, using four grains of calcium sulphide to each pint of water. This is continued until the flushings fail to show the presence of mercury.

The absorption therapy of animal or blood charcoal should be used when cases are seen early. One gram of Merck's 'Carbo Medicinalis" will bind 850 mg. of bichloride of mercury, 580 mg. of strychnine, or 40-50 mg. of phenol. Whatever treatment is instituted it calls for the intravenous injection of sodium chloride because of the chlorine impoverishment of the blood. This can be given with glucose which stimulates the secretion of urine. Rosenthal of the Public Health Service recommended the use of sodium formaldehyde sulphoxylate in intravenous injections of one gram. Wash out the stomach with a 5% sulphoxylate, using 250 cc., allowing 300 cc. of a 5% solution to remain in the stomach.

However, Brown and Kolmer were unsuccessful they report (Jour. of Pharm. and Exper. Therap., Baltimore, 52: 355, 1934) in their endeavor to corroborate the results obtained by Rosenthal with sodium formaldehyde sulphoxylate in mercurial poisoning. In their experiments, using only the minimal lethal dose of mercuric chloride, they had but indifferent success in saving the rabbits with sodium formaldehyde sulphoxylate. These authors believe that the chief value of sodium formaldehyde sulphoxylate as an antidote in acute mercurial poisoning lies in its use by mouth in sufficient quantities and sufficiently early. Intravenous treatment should be used cautiously and it must be given before one hour has elapsed from the time of the ingestion of the bichloride of mercury.

STRYCHNINE

Strychnine poisoning occurs occasionally in children who take the colored tonic tablets and Hinkle's pills for candy. All such preparations should be prohibited from sale unless given on a prescription by a physician. If a druggist dispenses preparations like these he should mark them with a poison label. The symptoms of strychnine poisoning are familiar to you all so we will not go into the symptomatology but will remind you of the use of barbiturates in strychnine poisoning because of their anticonvulsant efficiency. Sodium amytal may be give intravenously. Barlow suggests fractional intravenous injections of pentobarbital, the initial dose being 1/10 of a grain of sodium pentobarbital per pound of body weight and 1/20 grain per pound body weight when convulsions reappear. Caution should be exercised when more than four injections have been given during the first two or three hours. Apomorphine can be given, 1/10 of a grain for adults, for its emetic action causes evacuation of the unabsorbed strychnine from the stomach. The stomach should be washed out with potassium permanganate solution, diluted to the color of port wine. Give chloral per rectum to control convulsions when barbiturates do not act readily. Barbiturates are not as specific as the early claims indicated.

SOLVENTS

Poisoning by organic solvents is not common but can be avoided by prohibiting the sale of more than a pint of the solvent to the layman. Cleaners and dyers clean clothes so reasonably that it does not pay to take a chance with solvents like carbon tetrachloride, benzol, or trichlorethylene. These are chiefly of interest to the industrial physician but poisoning occurs even in the home with these solvents.

Benzol causes an extreme leucopenia caused by aplasia of the bone marrow affecting especially the granular leucocytes. The physician must not depend on a leucopenia for the diagnosis, for in benzol poisoning we may have an extremely low red count. In one case that I saw this last June the red count was 3,500,000, the white cells 950. But occasionally the red count may run as low as 1½ million cells. The clinical picture is one of progressive anemia with fatigue, weakness, bleeding from the gums and nose, followed by rapid decline, petechnial hemorrhage from the stomach, bowels and mouth. Temperature from 100 to 105 degrees, sometimes chills, with death from anoxemia and heart failure. One might confuse benzol poisoning with agranulocytic leucopenia. The lower the red count the less likely the disease to be true agranulocytosis. Von Hans Jost; (Archiv. für Gewerbepath. und Gewerbehyg., 31: 491, 1932), Yant and his associates (Jour. Ind. Hyg. and Tox., 18: 68, 1936) have demonstrated that there is an increase in the urine of the inorganic sulphates in the total sulphates in benzol poisoning.

Treatment: For the treatment of anemia it is necessary to give a transfusion of 300 to 500 cc. of blood. To strengthen the activity of the bone marrow daily injections of the various types of liver extracts may be tried. Pentnucleotide (N.N.R.) 0.7 grams intravenously and intramuscularly may stimulate bone marrow to prevent maturation arrest of white blood cells at the stem stage. However, it has failed to prevent death in one of my cases. X-ray of the large bones should be used for its stimulating effect.

TRICHLORETHYLENE

Symptoms: Entrance to the human body is usually by inhalation, although this may occur through the intact skin which will become seriously burned, followed by generalized toxic symptoms if the dose is sufficient. Trichlorethylene is closely related chemically with chloroform, and has a very similar narcotic as well as anesthetic action, 1.7 times as strong. Probably there is no cumulative action, but we do find serious chronic after-effects following acute attacks of poisoning. These may consist of anesthesia in the region supplied by the trigeminal nerve distributed over the greater part of the face and mouth. Of more consequence is atrophy of the optic nerve, leading to loss of vision. The corneal reflex of the eye may be lost.

The most dangerous medical feature of this drug is that it leads to addiction.

Treatment: The cardinal point in the treatment is removal from exposure. This may be most difficult in the event that the patient has become addicted to trichlorethylene.

Little or nothing can be done for the optic atrophy. Bronchitis, pneumonia and other lung irritations should be treated in the usual way. Damage to the internal organs such as the liver, spleen, and kidneys, does not respond very well to the treatment, but further progress of consequence terminates shortly after the end of exposure to the drug.

CARBON TETRACHLORIDE

Carbon tetrachloride (CCl_4) is a liquid with an agreeable odor. It is an excellent solvent for fats, oils and many organic substances. On account of its non-inflammability it is used in industry and in the home for dry cleaning of clothes. When inhaled, it leads to an irritating cough, headache, hiccough, nausea, vomiting, diarrhea, pain and tenderness over the liver. Jaundiced sclera are seen in the early stages.

Give calcium gluconate and saline solutions intravenously. It may be necessary to give epinephrine, caffeine sodiobenzoate, and digitalis for the cardiac involvement.

FUNDAMENTALS OF ELECTROCARDIOGRAPHY and the NORMAL ELECTROCADIOGRAM

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To many of us the EKG still continues to be a puzzle, a collection of mysterious peaks, depressions, curves and lines caballistically lettered PQRST. It is the purpose of this paper to do away with this mystery and to show that every peak, every depression, every curve or line is produced by a certain phase of the cardiac cycle.

First, a few words about the action current and the string galvanometer. (Fig. 1.)

PD is a strip of muscle with electrodes attached at each end and a galvanometer between these electrodes. The end P is stimulated—the active point P has a higher electrical potential than the resting point D. A current flows from P toward D in the muscle, but in the opposite direction through the electrodes. The galvanometer needle is deflected in the direction of the current through the electrodes. Let us indicate this deflection by a line directed upward from an imaginary horizontal line.

The excitation which began at P slowly spreads to D, finally the entire muscle is equally excited. D and P have the same potential, therefore there is no current flowing in the muscle and the galvanometer needle returns to rest. We will represent this change in the needle by a line directed downward.

This state, when both ends of the muscle are equally excited and when no current is flowing in either direction lasts for a fraction of a second and this is represented graphically by a horizontal line known as the isoelectric line.

Activity persists for some moments at the distal end D, while the excitation begins to subside

From the Third Medical Service of Dr. A. Arkin and EKG Service of Dr. H. J. Issacs, Mount Sinai Hospital.

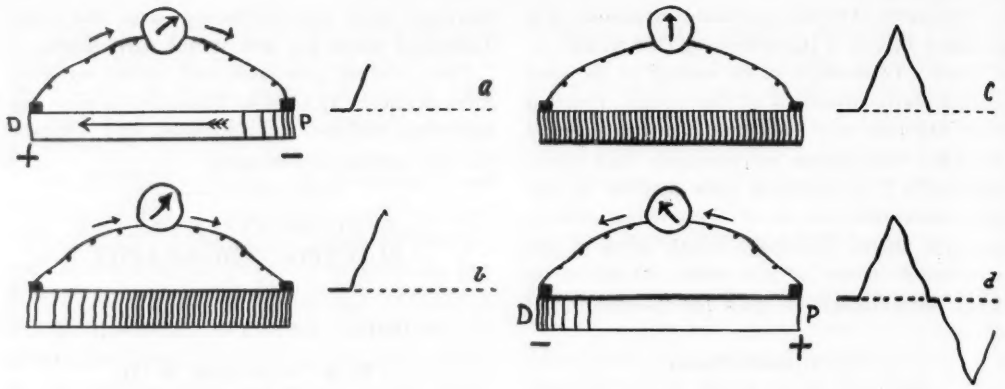

Fig. I. A simple strip of muscle is stimulated at P The diagram shows the resultant curve and relates its phases to the events in the muscle. (After Thomas Lewis)

at the proximal end P. D now has a higher potential, the galvanometer needle moves in the opposite direction. We will record it by a line downward.

The excitation subsides now also at D—the muscle returns to rest and so does the galvanometer needle—and we record this by a line returning upward to the isoelectric line.

The curve obtained shows the direction in which the excitation wave was traveling.

In the human heart the muscle bundles mainly run transversely, diagonally and longitudinally. It has been universally agreed therefore, to use three leads:

L. I.—Electrodes are applied to both forearms to investigate the transverse bundles.

L. II.—Electrodes are applied to the right forearm and left leg to investigate the diagonal bundles. This is the most important lead, as it corresponds to the anatomical axis of the heart.

L. III.—The electrodes are applied to the left forearm and the left leg to investigate the longitudinal bundles.

The current generated by the action of the heart is small, negligible. In the normal heart it varies from 0.1 to 1 millivolt. To detect it we must employ a sensitive galvanometer. The Einthoven galvanometer employs a fine quartz string which is so delicate that even the heart's tiny current causes it to vibrate while passing through it. The shadows of these string vibrations are magnified and photographed giving us a permanent record, an electrocardiogram.

The EKG machine is so stndardized that when the cardiac impulse is traveling from the base of the heart to its apex the resulting wave is directed upward and is called positive. When the impulse travels from the apex to the base, the resulting wave is directed downward and is called negative.

The machine is also standardized as far as the amplitude of the waves is concerned. An electromotive force of one millivolt produces a

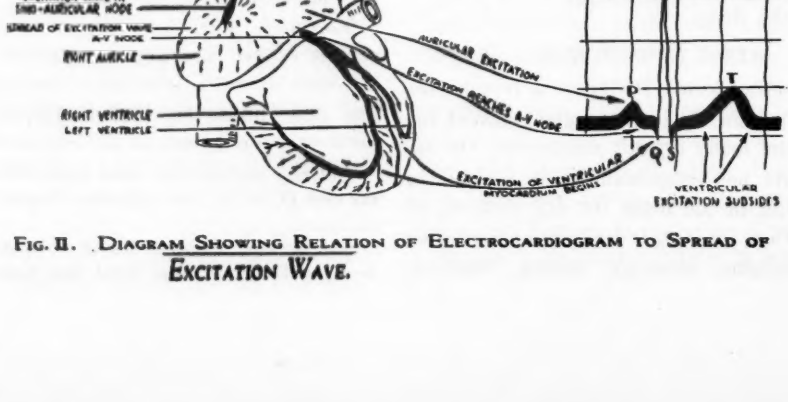

FIG. II. DIAGRAM SHOWING RELATION OF ELECTROCARDIOGRAM TO SPREAD OF EXCITATION WAVE.

deflection 10 mm. in amplitude, or 1/10 mv. produces a wave 1 mm. in amplitude.

With this in mind let us trace the cardiac impulse through a complete cycle from its beginning to the end in a subject who has formed a circuit with the electrocardiograph. (Fig. II.)

The impulse arises, as we all know, at the pacemaker, the S. A. node. The S. A. node is first to become active and from it the impulse spreads over the auricular musculature in concentric waves, similar to the effect produced by throwing a stone into a quiet pond. As you see the direction downward exceeds the sum total of all other directions, resulting therefore, in a positive wave named P. P then is produced by the contraction of the auricles. If both auricles contract simultaneously the P wave has the appearance of a smooth slope. Normally it is positive in all leads, but may be negative in L 3. Its duration is 1/10 sec. Its height varies from 1 to 3 mm. In hypertrophy of one of the auricles, as in mitral stenosis, the P wave is higher than 3 mm. becomes peaked and slurred.

For the next fraction of a second all parts of the auricles are equally contracted and no current flows in any direction. The string galvanometer is immobile resulting in an isoelectric period known as PQ or PR isoelectric interval. This interval normally varies from 0.13 to 0.20 sec. During this time the impulse passes over the AV node and the bundle of His up to its bifurcation.

As soon as the impulse begins to spread over the right and left branches of the bundle of His the interventricular septum and the attached papillary muscles become active, resulting in a negative Q wave. Q wave is absent in the EKG of frogs who have no interventricular septa. The excitation in the septum travels from the base to the apex. Therefore, Q should be positive, but in the attached papillary muscles the impulse travels in the opposite direction. Apparently the factor of the papillary muscles is greater than that of the septum. However, Q is a relatively unimportant wave and quite often absent. It is ignored usually except when it is very prominent.

From the septum the excitation continues to spread downward to the apex producing the most prominent positive peak, R. R wave should be most prominent in L 2, should not exceed 0.03 sec. in duration, and should be not less than 5 mm. at least in one of the leads. It must appear as a smooth sudden rise and an equally smooth and sudden descent to or below the base line.

From the apex the excitation begins to spread upward to the base, producing a negative wave S, which is also a relatively unimportant wave. Within the next fraction of a second both ventricles are in a state of systole and there is no difference in potential between any two points. The string galvanometer is immobile producing the second isoelectric period known as the ST interval. This interval corresponds to the systole of the ventricles.

Within the next fraction of a second activity at the apex begins to subside, but still persists at the base. The current now flows from base down to the apex resulting in a positive wave T. This wave is important. It is prominent in young adults, and becomes less conspicuous with the advance in age. It is prominent in thyrotoxic states. When the ventricular myocardium is damaged or replaced by fibrous tissue, the T wave, particularly in Lead one and two, becomes negative. Digitalis has a tendency to invert the T wave.

Now activity begins to subside also at the base. The ventricles are in diastole. The string galvanometer remains immobile, resulting in the 3rd isoelectric line—until a new impulse arises at the S.A. node and the whole cycle repeats itself.

A normal cardiac cycle then produces a curve which consists of 5 deflections and 3 isoelectric intervals between these deflections. Every one corresponds to a certain phase of the cardiac cycle. The 1st, 3rd, and 5th deflections are positive, the 2nd and 4th are negative. Besides direction these deflections must also conform to certain limits in amplitude, duration and shape, as outlined.

The first isoelectric period corresponds to auricular systole and has a definite duration not less than 0.13 sec. and not longer than 0.20 sec.

The second isoelectric period corresponds to ventricular systole. While having no definite duration, it is, however, very important. Elevation or depression of this isoelectric period above or below the base line is undisputed evidence of disturbed coronary circulation.

The third isoelectric period corresponds to

ventricular diastole. Its duration, therefore, depends on the rate of the heart.

104 S. Michigan Ave.

A STATEMENT TO PHYSICIANS ON THE VENEREAL DISEASE SITUATION

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The outlook for controlling the venereal diseases in Illinois is more promising now than at any previous time in the history of the State. An aggressive public interest in the problem has been aroused. Newspapers are encouraging with vigor a growing popular demand for an effective program. The Council of the Illinois State Medical Society has adopted a strong resolution expressing the determination of the medical profession to cooperate wholeheartedly with State and federal public health authorities in combatting these diseases. Considerable sums of money are available from the National Government *through* the State Department of Public Health for aiding municipalities and rural communities in developing and maintaining adequate and efficient programs of control. The Illinois General Assembly now sitting will be asked to appropriate approximately $300,000 per year for the same purpose. If granted, something more than half a million dollars annually will be available from official State and National sources for the purpose of combatting venereal diseases.

In the light of this situation it seems important to invite the attention of the medical profession to the overshadowing importance of promptly reporting all cases of these diseases which come to their attention. It seems wise also to outline the proposed program which the State Department of Public Health expects to follow.

Since success in prosecuting a program depends more upon prompt and complete case reports than upon any other one factor, that point can not be emphasized too strongly. Excerpts from the regulations of the State Department of Public Health with respect to notification, which have the weight of law, read as follows:

Rule 2. Every physician, drugless healer, nurse, attendant, druggist or pharmacist, laboratory worker, dentist, superintendent, or principal directing officer of a hospital, jail, house of correction, asylum, home or similar institution, or other person having knowledge of a known or suspected case of venereal disease or its sequelae, which is either communicable, contagious or dangerous to the public health, shall promptly report such known or suspected case to the local health authorities. In cities, towns and villages of 5,000 population or less, not having a full-time medical health officer, the physician or other person making the report may report either to the local health officer or to the Illinois Department of Public Health at Springfield. Reports of cases in such cities, towns or villages, as have a full-time medical health officer, shall be made directly to this officer.

Cases of venereal disease shall be reported on special blanks furnished to physcians by the Illinois Department of Public Health, except in cities having a population of 500,000 or over, in such cities the reports may be made on blanks or cards furnished by the local health department. Venereal diseases may be reported by key number instead of by name, except when the patient disregards the instructions of the physician.

Rule 3. Because of the confidential nature of venereal disease reports, these shall be forwarded, except as otherwise specified, on special blanks furnished by the Illinois Department of Public Health and not on postal cards. These forms must be enclosed in an envelope. Such reports shall, except as otherwise hereinafter provided, state the name, address, age, sex, color, marital status and occupation of the infected person, the name and address of employer.

They shall state the name of the disease, its duration, the name and address of the person, who is the probable source of his infection, and any other pertinent information regarding the patient, such as the nature, the date of onset and all other pertinent information concerning prior infections with any venereal disease; the names and addresses of persons he may have exposed since the beginning of this infection and any other information which might be of value in tracing and thus locating at the earliest moment, other cases of venereal disease.

(a) Upon receipt of a report of venereal disease, the local health authority shall, within twenty-four hours, forward a copy of the same to the Illinois Department of Public Health, Springfield, except in cities with an approved health department, the Director of the Illinois Department of Public Health may agree to accept daily tabulated reports and monthly and annual statistical reports from such cities.

(b) Every case of infective venereal disease shall be reported as above.

Rule 4. The correct name and address of the diseased person and the name and address of the employer of the diseased person may be omitted from the report under the following conditions:

(a) If the treatment agency or reporting agency or physician agrees in writing on a form provided for the purpose to assume responsibility that the infective case or carrier will not cohabit with or otherwise expose others.

(b) And the physician or reporting agency agrees to keep the name and address and key number in serial order in a private record book open to periodic in-

spection by the State and local health authorities but to no one else; agrees to keep records of prescriptions given and dates, treatment given and dates, and disposition of the case; states that proper instruction has been given regarding infectivity of venereal diseases; states that the patient is following all instructions regarding treatment and prevention of spread of the disease to others.

When all of these conditions have been met, the physician's report of the case to the local health authorities may state the diseased person's case or key number in lieu of his name; the name of the city, village or town, in lieu of his definite residence, and may omit the name and address of his employer.

Such reports are to be kept on file by the local health authority readily available for this purpose. One section of the file or book shall be devoted to records of each physician so reporting.

Rule 6. Upon termination of treatment of a case of venereal disease, which has been reported by case or key number, the attending physician shall report the fact to the local health authorities or to the health authority, to whom the original report was made, giving name (case or key number), the date upon which the case was terminated and upon what grounds the case was terminated (i. e., cured, transferred to another physician, lapsed treatment or died, etc.). If the diseased person lapses treatment and is still in an infectious condition, the physician shall advise such diseased person that further treatment is necessary and if no notification of transfer to another physician has been received by him after lapse of treatment within ten days, the name and address of such patient shall be reported to the local health authority or to the health authority to whom the original report was made.

It is the established policy of the State Department of Public Health to aid at all times the maintenance of ethical relations between patients and physicians. Reports will be used primarily to assist physicians in keeping patients under treatment until permanently noninfective, in making epidemiological studies to detect and dry-up sources of infection and for statistical purposes.

STATE OF ILLINOIS

Department of Public Health

Pertinent Facts About Syphilis

1. More cases of syphilis are reported annually in Illinois (an average of 15,000) than of any other disease except measles and scarlet fever. There were 16,879 cases of syphilis reported in 1936, a number greater than of any other disease except scarlet fever with 22,594.

2. Only 20 per cent. of case reports are of patients in the early acute stages of the infection when cure under adequate treatment is possible, while 60 per cent. are of patients in the late stages, when cure is at best difficult.

3. Nearly two-thirds of all work done in the diagnostic laboratories of the State Department of Public Health (159,744 or 62 per cent. of 257,021 tests done in the fiscal year ended June 30, 1936) relate to syphilis. The various local laboratories probably do in the aggregate a great many more tests for syphilis than do the State laboratories. This suggests the magnitude of the medical and allied services incurred because of syphilis.

4. About 1,000 babies congenitally infected with syphilis are born annually in Illinois. This estimate is based upon the experience of the Cooperative Clinical Group which indicates that upwards of 1 per cent. of all babies born in this country are congenitally infected.

5. At any one time there are 1,400 paresis (always due to syphilis) patients in the State hospitals for the insane in Illinois and studies indicate that about 2,700 of the inmates of these hospitals owe their condition to syphilis. On this basis, syphilis is responsible for about one-tenth of the approximately $12,000,000 spent annually for the care of the insane in Illinois.

6. Through official and voluntary channels the public pays about $500,000 annually for the medical care of syphilitic patients. This is in addition to expenditures through State hospitals and by private pay patients.

7. Most new infections of acquired syphilis in the male are among persons between 18 and 24 years of age, while a considerable proportion of acquired syphilis among females is contracted through marriage.

8. The late effects of untreated syphilis, occurring 10 to 30 years after infection, include general paralysis, locomotor ataxia, heart disease (a study of deaths attributed to heart disease in Washington, D. C., revealed that 12 per cent. were due to syphilis), sterility, nervous breakdown, insanity (a study of several thousand patients admitted to the Boston Psychopathic Hospital showed that 10 per cent. owed their condition to syphilis) and the congenital infection of babies.

9. Many women are innocently infected by husbands who believe themselves cured or who suffer from an unrecognized infection.

10. Blood tests of pregnant women followed by appropriate treatment initiated before the fifth month of gestation will prevent in practically all cases the birth of syphilitic babies to infected women.

11. Proper treatment will render a syphilitic person noninfective within a day or two and continued treatment will keep him so. Appropriate, adequate treatment when started early enough after acquired infection leads to a cure in practically all cases.

12. From a medical standpoint, syphilis is one of the easiest of all common diseases to control.

13. Failure in the past to recognize syphilis from a scientific instead of a social point of view has made impossible its control. If syphilis could be looked upon as simply a serious communicable disease in the same way as tuberculosis, it could be eradicated within a few years at most.

14. Syphilis is confined to no social or economic group but is found among all classes. Confidential surveys and records at the great clinics of the country provide evidence of this fact.

Proposed Program

If sufficient funds are made available the State Department of Public Health proposes to inaugurate a program that will embrace the following features:

1. Distribute entirely free of local cost all drugs necessary for the proper treatment of syphilitically infected persons without regard to their ability to pay. The purpose of this is to encourage early and adequate treatment by reducing the cost to the patient.

2. Give financial assistance to municipalities for the establishment and maintenance of approved clinics for the treatment of indigent patients and for conducting efficient programs of control.

3. Enlarge the public health diagnostic laboratory facilities, State and local, so that blood tests will be available to all persons who may need the tests. This would make practicable, among other things, routine blood testing of prospective mothers by all physicians who participate in the syphilis control program.

4. Employ qualified epidemiologists to trace down the source of all infections, so far as possible.

5. Organize facilities for stimulating more complete reporting of cases, especially for early infections. Early and complete reports are essential to locating sources of infection, on the one hand, and to encourage adequate treatment, on the other.

6. Employ eminent syphologists and other specialists to conduct refresher courses in the newer methods of diagnosis and treatment for practicing physicians. County or regional meetings would be held for this purpose from time to time.

7. Conduct public educational programs. These would embrace among other things the holding of institutes from time to time in communities throughout the State.

EFFECTIVENESS OF THE ORAL ADMINISTRATION OF EPHEDRINE IN THE COMMON COLD

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AND

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The problem of the common cold, from whatever angle it has been attacked, has proven to be one of the most colorful in the field of science. Untold effort and stupendous sums have been expended, and while results have been obtained, yet, the future alone holds many of the answers. In dealing with any phase of this subject one has to be markedly circumspect. Statements have to be made with care and can not be too ambiguous, because the reader of reports of this nature is too prone to make note of the more favorable aspects, and to accept facts as proven which, when subjected to a more careful analysis, would fall into an entirely different category. Works of this nature, if fruitful at all, unfortunately receive extensive undeserved publicity. The reading public is momentarily raised to a state of expectancy or to use the vernacular, one might say that it is built up to an awful letdown. It is not the purpose of this paper to leave any impression that we have found a cure for the common cold. The word "treatment" was purposely left out of the title, because to many, treatment suggests cure. It is our intention merely to give ample reason for undertaking the type of investigation pursued, to give reason for the employment of the chosen type of therapy, and to carefully and in detail ,analyze the result. The final evaluation is left entirely to those who have kindly condescended to be in attendance at this presentation and to those who possibly may subsequently peruse this report in published form.

That the common cold is a scourge to the human race both individually and collectively is well known. The employer is faced annually with the problem that during the colder months there will be absences from work by large numbers of his employees, and temporary lowered efficiency on the part of those who manage to continue in attendance in spite of their respiratory distress. The individual, and particularly he who is susceptible to colds, is faced annually with the anticipation of the period during which he may be confined to his home with his earning power reduced, or if he can continue with his daily duties, a period of marked discomfort and lessening of efficiency. The Metropolitan Life Insurance Company reported in 1923[1] for the common cold and associated infections a rate of 420.7 per 1000 employees, an average loss of 2.2 days per case, and a total loss during the year of 6,233 days. In 1926[2] the same company reported a rate of 1,345 absences annually for each 1000 employees, a loss of 45,254 working days, and an average of 3.7 days duration per case. In 1926 tonsillitis was included in the estimates and the total number of clerical workers was approximately 9,204 as compared with 6,700 in 1923.

Therefore, while it is true that there is no specific remedy for the common cold, nevertheless, any type of therapy which can shorten the

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The various combinations of Ephedrine and Amytal were prepared and furnished us through the courtesy of Eli Lilly and Company, Indianapolis, Indiana.

course or markedly alleviate the discomforting symptoms of such an infection for the countless number of annual sufferers, should certainly be looked upon with favor, if its efficiency can be proven with satisfaction. From time immemorial countless combinations of drugs have been prescribed and employed for this purpose. One of the most recent is the preparation of Diehl.[3] While his formula seems quite effective, it is definitely narcotic, and it is not unreasonable to suppose that the chief motive action of this treatment is that the patient does not care whether he has a coryza or not, having been rendered less alert to his distress by having been made somewhat "dopy." Considering that most cases of coryza may be fundamentally of an allergic nature, we decided to experiment with an ephedrine preparation which has been successfully employed in some cases of asthma, hay fever and other allergic states. Since ephedrine has a tendency to cause psychic excitation, especially insomnia, it seemed rational to combine it with a sedative such as isoamylethylbarbituric acid.*

We first employed in combination, ephedrine sulphate 0.024 gm (3/8 grains) and isoamylethylbarbituric acid 0.048 gm (3/4 grains). While the results were encouraging in this first series, seven cases exhibited unpleasant reactions to the drugs such as palpitation, gastric distress and dizziness. In an attempt to eliminate such reactions the dosage in the second series was changed to ephedrine sulphate 0.008 gm (1/8 grains) and isoamylethylbarbituric acid 0.016 gm (1/4 grains). The results were as satisfactory as in the first series.

Two cases of palpitation occurred, but there were no cases of gastric distress or dizziness. The logical procedure to obviate the possibility of the further occurrence of palpitation as an aftermath to the intake of ephedrine was to increase the isoamylethylbarbituric acid. This was done and in the third series we employed, ephedrine sulphate 0.008 gm (1/8 grains) and isoamylethylbarbituric acid 0.024 gm (3/8 grains). Again the results were equally satisfactory and this time no undue drug effects were noted. On this basis, therefore, the dosage as employed in the third series is considered the one of choice. In the first series the medication was administered every four hours, and in the second and third series every two hours, the latter being the time interval of choice. The patient was advised not to take in excess of six doses in one day and to stop the medication as soon as relief was noted.

In obtaining data for analysis the following form was used. When a subject applied for treatment he was required to fill out the first part of the form, and then he was required to return at intervals of 24, 48, and 72 hours and fill out the subsequent parts as indicated for those periods. Each form was filled out by the patient himself and is a direct expression of the effect noted by him. We felt that information obtained in such a manner is of more value than that obtained by questioning the individual and then filling out the form for him.

QUESTIONNAIRE EMPLOYED

Date.....

Name .....
Age .....
Sex .....
Occupation .....
Are you subject to "colds"?.....
How many times during each year do you have colds?.....
When you have a "cold," how many days does it usually last? .....
What are your usual symptoms when you have a "cold"? .....

PRESENT COMPLAINT

1. Date of onset.....
2. Local symptoms
3. General symptoms

RESULTS OF MEDICATION

After 24 Hours

1. Improved or not improved?
2. If improved, state specifically what symptoms were alleviated.
3. After how many capsules did you first notice improvement?

After 48 Hours

(State any additional changes noted and also state whether there was additional medication.)

After 72 Hours

(Summarize your present condition, giving your opinion of whether the medication has shortened the course of your infection in comparison to your previous experience and how it compares with medication of other types taken by you in the past.)

The analysis of the data obtained is given in the following tables:

TABLE 1. ANALYSIS OF CASES TREATED

	Series I	Series II	Series III
Ephedrine	3/8	3/8	3/8
Amytal	3/4	3/4	3/4
TOTAL CASES TREATED...	109	137	256
Improved	93–85%	114-83%	211-82%
Not improved	16–15%	23–17%	45–18%

*Additional experimentation has convinced us that phenobarbital is as efficacious in combination with ephedrine as amytal.

IMPROVED			
Subject to colds	70	85	178
Not subject to colds	23	29	33
SUBJECT TO COLDS			
Duration less than five days	23	17	41
Duration over five days	47	68	137
NOT SUBJECT TO COLDS			
Duration less than five days	11	8	8
Duration over five days	12	21	25
NOT IMPROVED			
Subject to colds	11	17	35
Not subject to colds	5	6	10
SUBJECT TO COLDS			
Duration less than five days	2	3	8
Duration over five days	9	14	27
NOT SUBJECT TO COLDS			
Duration less than five days	0	2	2
Duration over five days	5	4	8

TABLE 2. ANALYSIS OF CONTROLS

(Capsules contained only milk sugar)

TOTAL CASES	64
Improved	17
Not improved	47
IMPROVED	
Subject to colds	16
Not subject to colds	1
SUBJECT TO COLDS	
Duration less than five days	10
Duration over five days	6
NOT SUBJECT TO COLDS	
Duration less than five days	1
NOT IMPROVED	
Subject to colds	38
Not subject to colds	9
SUBJECT TO COLDS	
Duration less than five days	13
Duration over five days	25
NOT SUBJECT TO COLDS	
Duration less than five days	3
Duration over five days	6

TABLE 3. AVERAGE DOSAGE

FIRST GROUP (E ⅛ and A ¼)	
Those subject to colds	4.8 Capsules per person
Those not subject to colds	5.4 Capsules per person
SECOND AND THIRD GROUPS (E ⅛ and A ¼-⅜)	
Those subject to colds	4.0 Capsules per person
Those not subject to colds	4.4 Capsules per person

TABLE 4. UNDUE EFFECTS OF MEDICATION

EFFECTS NOTED

1. Palpitation.
2. Dizziness.
3. Nausea.

INCIDENCE OF EFFECTS	
Group 1	Seven cases
Group 2	Two cases
Group 3	No cases

TABLE 5. FINAL ANALYSIS

TOTAL CASES TREATED IN THREE GROUPS	502
Improved	417 or 83%
Not improved	85 or 17%
TOTAL CONTROLS	64
Improved	17 or 26%
Not improved	47 or 74%
CASES TREATED	
DURATION OVER FIVE DAYS	
Improved	300 or 82%
Not improved	67 or 18%
DURATION LESS THAN FIVE DAYS	
Improved	108 or 81%
Not improved	25 or 19%
CONTROLS	
DURATION OVER FIVE DAYS	
Improved	6 or 16%
Not improved	31 or 84%
DURATION LESS THAN FIVE DAYS	
Improved	11 or 40%
Not improved	16 or 60%

While it is true that the tables of analysis are more or less self-explanatory, we would like to call attention to a few of the pertinent facts exemplified. Initially it seemed that better evaluation could be brought about relevant to improvement if the subjects were divided according to predisposing tendencies and duration of infection. This scheme has been carried out in our analytical tables and, as a result, we are able to obtain certain information which would have been inaccessible had we considered the group as a whole solely from the point of view of improvement or lack of improvement. It is noted that the majority of persons treated comprises those subject to colds, and that of these, those in which the duration is longer than five days are in excess. Those who were subject to colds seemingly responded better and required less medication than those not subject to colds. It is observed that the treated cases of duration over five days shows 82% improvement compared to 16% in the controls, and that the treated cases of duration less than five days show 81% improvement compared to 40% in the controls. This high per cent. of improvement in the controls whose duration is less than five days suggests that the group is not an indicator of response to treatment since a large number of such subjects recover without therapy. Undoubtedly the patronage of these individuals whose duration of colds is less than five days is to a great extent responsible for the existence and favorable reports on various proprietary cold remedies. We base our evaluation entirely on the response in those in whom the course of infection routinely exceeds five days. In considering the unimproved treated cases we found that in practically all cases, in addition to the coryza, there were other symptoms such as fever, cough, sore throat, laryngitis, etc. Of those unimproved treated cases having only a simple coryza, it was found that they had not reported for treatment from three to twelve days after the onset. The

best results were always obtained in patients reporting within 24 to 48 hours after the onset.

SUMMARY

1. A study has been made of 566 cases of acute coryza in adults during the years 1934, 1935, and 1936.

2. Of the cases studied 502 were treated and 64 were employed for controls.

3. The observations in the treated cases were concerned with the response to varying combinations of ephedrine and amytal.

4. The dosage of choice proved to be ephedrine sulphate 1/8 grain (0.008 gm) and amytal 3/8 grain (0.024 gm).

5. The optimum dosage of this drug combination is considered to be six capsules or tablets per day with an interval of two hours between each dose.

6. In every case it was advised that medication be stopped as soon as definite improvement was noted.

7. The number of doses necessary to elicit improvement varied from a minimum of one tablet or capsule to a maximum of twelve tablets or capsules with an average intake per person of from 4.0 to 4.4 tablets or capsules.

8. The most satisfactory results were obtained in those who reported for treatment within 24 hours after onset.

9. The controls were given capsules of milk sugar indistinguishable from those containing the actual medication.

10. The treated cases evidence 83% improvement as compared to 26% in the controls.

11. Inasmuch as 40% of the controls whose usual period of illness did not exceed five days improved, it is considered that the inclusion of such individuals in the final evaluation of response to therapy will result in over optimism in regard to the noted effect, and it is for this reason that we base our conclusions on that group in which the duration of illness exceeds five days.

12. Patients having fever, sore throat, cough, laryngitis and purulent nasal discharge did not respond well, and neither did those who applied for treatment later than three days after the onset.

13. From the reports of the subjects treated it may be concluded that the course of infection was shortened and improvement was noted earlier as compared to the various types of remedy employed by these same individuals in the past.

14. On the basis of relief obtained in regard to nasal symptoms and discomfort, ephedrine taken orally is at least equally efficacious as ephedrine applied locally, and its employment is certainly easier.

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DISCUSSION

Dr. E. F. Pearson, Springfield: It is getting rather late and I will not attempt to read my discussion. I wrote Dr. Gowen that I thought the main thing I would consider in discussing his paper would be the question, "What is a common cold?" We see a good many people who say, "I have a cold" every time the wind changes or every time they sneeze. I think one cannot always take the patient's diagnosis and it is very difficult to make an objective diagnosis. Therefore, it is extremely arduous to evaluate the therapeutic efficacy of any treatment even in a large series.

There are a large number of people who have frequent "colds" that are not "acute coryza." These are allergic or hypersensitive manifestations to physical agents. One can catch heat as well as one can catch cold. That may sound revolutionary, but I have seen a considerable number of hypersensitive people who catch heat about as frequently as others catch cold. The individual suddenly gets overheated and promptly has a running nose. The resistance of the mucous membrane is lowered and the organisms are allowed to grow. Most people who die after heat exhaustion have early bronchopneumonia.

In the allergic type of "cold" I am quite certain ephedrine has a place because anything that tends to decrease the edema of the nasal mucous membrane will allow drainage and more rapid subsidence of catarrhal exudate.

It seems a little unreasonable that ephedrine or any other drug taken by mouth would have very much effect on a true epidemic acute coryza. Of course, if drainage is kept up, the discharge will clear up quicker.

I think this paper is an interesting addition to our knowledge concerning the therapeutics of colds and I am sure in a good many instances it is as good a thing that one can do for the patient besides bed rest.

Dr. Lloyd Arnold, Chicago: This therapy does not involve absence from classes. Most of the subjects were adult young men and women in the freshman class of the University of Illinois at Chicago.

I think the question Dr. Pearson brought up is very interesting. It is very intimately associated with our present employment of artificial air conditions in the summer time. You can catch cold or catch heat,

either one. In walking across a door threshold, going inside or outside of a room, there is sometimes a change of as much as 20° or 30° F., with unknown humidity and unknown air velocity inside and outside, complicating our whole upper respiratory adaptation to our environment. As we create the man-made environment inside of the room and God Almight does it outside, in the summer time, the varying conditions outside and the constantly lowering conditions inside immediately enter into quite a complex field of adaptation for the upper respiratory tract, which is certainly becoming more and more acute in our problems of health.

I will not discuss the upper respiratory disturbances —I think that is a better name—that Dr. Gowen has been working with. It is upper respiratory disturbances of recurring types.

I know in our student body this forms of therapy has been exceedingly popular. They maintain their standing in classes; they carry their work in a uniform manner with this form of therapy.

Dr. Gowen, in closing: I wish to thank Dr. Pearson for his participation in the discussion, and I would most certainly like to voice, at this time, the expression of my appreciation to Dr. Lloyd Arnold, whose cooperation at the University of Illinois College of Medicine made this work possible.

PHYSICAL THERAPY AS APPLIED TO THE EYE, EAR, NOSE AND THROAT.

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The Council on Physical Therapy of the American Medical Association published an article on the "Evaluation of Methods Used in Physical Therapy" by Karsner and Goldblatt.[1] This article states that the evaluation of a treatment is not to be measured by the opinions of the physician but rather by the facts he can demonstrate. The study of the effects of physical therapy is largely an experiment on human beings. This experiment should be conducted with all the deliberation and forethought of experiments in any line of scientific work. There are two methods suggested for this experiment—the statistical and the comparative or blind test. It is believed that every physician using a new method of physical therapy should read this article, and evaluate his results according to its suggestions.

Eye. The circulation of the blood is greatly reduced in any local area to which cold is applied. In the first stages of acute inflammation such as gonorrheal ophthalmia, acute conjunctivitis, acute orbital cellulitis, in ecchymosis of the lid or subconjunctival hemorrhage cold applications often reduce the amount of swelling and relieve the pain. Gifford[2] warns that the cold should not be continuous due to the possibility of lowering the vitality of the cornea. Usually it should not be continued for longer than 24 to 48 hours.

Heat produces an active hyperemia with its physiologic effects. The kind and amount of heat to be applied in eye conditions has not been definitely determined. It is known that often hot moist dressings are of more value than the forms of heat producing more intense temperatures. Heating the tissues up to 102 F. causes the rate of blood flow through the capillaries to be increased, tissue metabolism to be accelerated and the rate of exchange between the blood and tissues to be increased and to reach its optimum so that the blood entering the vein contains 60-65% of its saturated value of oxygen. Above 102 F. the rate of blood flow is so rapid that the blood entering the vein simulates arterial blood and contains about 91% of its saturated value of oxygen. These facts may explain the value of the less intense forms of heat.

The penetration of the various forms of heat in the eye have been determined.[3] In studies of infra-red radiation, a heating pad and conventional medical diathermy applied to the eyes of narcotized dogs, it was found that the skin and superficial tissues tolerate the diathermy currents to a maximum of 600 ma., and also the infra-red radiation better than they do conduction heat from electric resistance heating pad. Therefore a greater input of energy and consequently a greater rise of temperature is produced by diathermy than by either of the other two methods and by infra-red radiation than by conduction heat from the electric heating pad. It is significant that even in the anterior zones the heating power of diathermy, within the limit of skin tolerance is greater (about 2 C) than that of infra-red radiation and much greater (about 4 C) than that of the heating pad. In spite of the superior penetrating power of contact metal electrode diathermy there is little use for it in eye conditions due to the dangers of burns. Recently short wave medical diathermy has been introduced. There is much less danger of burns and considerably more penetration but

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the indications for its use are by no means well established, and there is still the possibility of burns.

The raising of body temperatures by physical agents has a definite value in certain selected severe cases of iridocyclitis,[4] corneal ulcer and choroiditis.[5] In our experience hyperpyrexia has not shown any results in optic atrophy associated with tabes dorsalis.

Hyperpyrexia should be used only in hospitals surrounded with safeguards commonly employed in a major surgical operation and given under the direction of skilled physicians and technicians. There are a number of contraindications. To subject a patient to an artificial fever of 105 or 106 F. for five hours or more is not without danger.[6] In our opinion short wave medical diathermy by the electromagnetic induction method is the most effective and the least dangerous of the physical methods used to produce hyperpyrexia.

Surgical diathermy is indicated in the removal of superfluous eye lashes, in the destruction of the corneal portion of a pterygium, a small chalazion on the free lid border and in retinal detachment.

Local ultraviolet radiation has a definite bactericidal effect and produces a local erythema. It is of benefit in corneal ulcer, tuberculosis of the cornea and conjunctiva herpetic lesions and blepharitis. For local use there is still some questions as to the best form of radiation. Gifford at Northwestern uses a carbon arc lamp with a filter of uviol glass and quartz lens system, and believes that the lamp has a use in a large clinic but the average ophthalmologist has little use for it in his office.

General ultraviolet radiation is of benefit in phlyctenular keratitis and in ocular conditions due to tuberculosis.

Ear. Heat in the form of hot wet dressings or radiant heat is of value in otitis externa, perichondritis, chondritis and suppuration of the auricle, herpes oticus, otitis media and acute mastoiditis. Beck and Guttman[7] state when treating otitis media the use of medical diathermy is contraindicated before the rupture of the drum and after incision it is of little benefit. For acute mastoiditis medical diathermy is mentioned only to be condemned in such conditions. For chronic otorrhea, they state, as a rule they have seen little or no benefit follow the use of medical diathermy in spite of the enormous amount of literature dealing with the use of these agents in this condition. In the management of deafness, their opinion is that medical diathermy has caused little if any benefit in deafness due to chronic adhesive otitis media, otosclerosis or labyrinthine deafness. They state that in tinnitus aurium the use of diathermy has been attended with little success.

Surgical diathermy is useful in the early and radical removal of malignant disease of the auricle combined with irradiation with x-ray and radium.

Local ultraviolet radiation is a remedy par excellence in erysipelas of the auricle. A severe erythema dose should be given. It is also useful in a furunculosis of the external auditory meatus, in eczema of the auricle, and in pruritus of the external auditory canal. Local ultraviolet radiation due to its bactericidal effect and its stimulating effect on the skin is of definite aid in slow healing of wounds following mastoid surgery.

Local ultraviolet radiation is advocated in selected cases of chronic otorrhea. If the ultraviolet radiation can reach the bacteria it has a bactericidal effect but a thin layer of mucus or pus will filter out the ultraviolet radiation and prevent its action. Therefore we have seen little benefit follow its use in chronic otorrhea.

Local and general ultraviolet radiation according to Hollender[8] has its most important role in the treatment of tuberculosis of the middle ear.

Favorable reports on the use of zinc ionization in chronic otitis media have been made by many. According to Hollender[8] there is not available sufficient evidence on the use of ionization in otology to place it on a firm scientific basis although he believes it to be good in selected cases. Those patients who have a low grade mastoid infection, pathological adenoids, cholesteatomata, aural polyps, or a small perforation of the membrane are considered to be cases in which the treatment is contraindicated.[9] This method has been known for years yet it is used by only a few physicians. The reasons for this would seem to be that in a great percentage of cases it will not produce results until the indicated surgery is completed; there are many con-

traindications; at the most it is only an effective method of applying an astringent; and it requires a complicated technic.

Nose. Heat by means of hot moist dressings or infra-red radiation should be used locally in the treatment of furuncle of the nose. Hydrotherapy and local applications of radiant heat over the face and sinuses are of value in the treatment of an acute rhinosinusitis.

In a series of experiments to determine the heating value of various physical methods applied to sinuses Andreen and Osborne[10], at our department at Northwestern University Medical School, introduced a thermocouple into the natural opening of the antrum and applied convential diathermy, short wave diathermy by electric field (16 meter) and electromagnetic induction, infra-red radiation from a thermo-spectral water cooled lamp, the Compsolite and the Elliott treatment. The temperature rises were insignificant in any of these methods ranging from 0.4 to 0.9 F. Shambaugh[11] recently gave an analysis of the pathology of chronic sinusitis that prevents spontaneous recovery. With a picture of the pathology of chronic sinusitis before us it is impossible to see the value of the most efficient methods of applying heat in these conditions, if they only give such a small rise of temperature in the antrum. This means that their effect is limited to a circulatory increase in one wall of the sinus.

Surgical diathermy is used in rhinophyma, in the intramural coagulation of the turbinates, nasal polypi and in malignant tumors of the nasal sinuses in combination with x-ray and radium.

In my experience general ultraviolet radiation prevents recurrent attacks of rhinitis, but the Council on Physical Therapy will not accept this claim as it has not been proven with controlled experiments. The local use of ultraviolet radiation in nasal or sinus conditions is limited by its inability to reach the affected area, its inability to penetrate even a small surface accumulation of pus and the fact that the dosage for the destruction of bacteria and tissue cells is nearly the same, so that the destruction of the bacteria causes some normal tissue necrosis.

There are three sources of artificial radiation —carbon arc, mercury or hot quartz and the cold quartz. Laurens[12] believes that if one is forced to use artificial energy instead of sunlight for general body radiation a lamp which exhibits a continuous spectrum like the sun should be used rather than one which emits the shorter ultraviolet rays. Solar radiation rarely contains radiation with wave-lengths shorter than 3000 angstroms. The cold quartz mercury lamp emits radiation with 95% of the wavelengths less than and including 3,130 angstroms in the resonance line at 2537 angstroms which is not a spectrum like the sun.

Ionization of the nose for allergic conditions was studied by McIntyre and Osborne[13] at Northwestern University Medical School this year. A total of 21 cases were treated, but they feel that sufficient time has not elapsed to make a positive statement. They do feel that ionization is a valuable aid for relieving allergic nasal symptoms, but not a specific. Hollander[8] states that it produces a profound structural alteration of the nasal mucosa and believes that one must accept the fibrotic change in the nasal mucosa as responsible for success. Many favorable reports have been made on ionization of the nose in the treatment of hay fever and rhinitis of allergic or vasomotor origin. These reports do not emphasize the fact that the patient suffers considerable discomfort with pain and a sensation of pressure in the nose for some hours following ionization.

Schall[14] questions whether the effect of ionization is anything more than a cauterization of the mucous membrane. He states that Palmer in thirty cases of vasomotor rhinitis secured the same results by the local application of concentrated phenol. Ramirez[15] has not had success in the ionization treatment of hay fever but secured benefit in non-specific perennial vasomotor rhinitis. After reviewing the literature and with the experience of the cases at Northwestern we agree with Hurd[16] that the method has not been used long enough at present to determine its actual value and dangers.

Throat. The history of the use of many physical agents in the treatment of diseases of the ear, nose and throat is similar to that of electrocoagulation of the tonsils. A few years ago this method was sold by the manufacturers of the instruments for electrocoagulation as a simple method for any physician to use for the removal of tonsils. To-day it is known to be the most difficult and dangerous method in the hands of the unexperienced. Skillern[17] states that the

dangers and difficulties are in proportion to the lack of knowledge and no one who is not capable of removing tonsils by other surgical technic and meeting all complications that may arise during or after the operation should attempt their removal by electrocoagulation. It does not reduce the cost of the operation for the patient. In Savitt's[18] series the number of treatments varied from 12 to 26. It is not a suitable method for children and nervous patients.

Electrocoagulation has a small place in the hands of the laryngologist for cases of advanced tuberculosis, exophthalmic goiter or myocardial degeneration that must have the tonsils removed. It is an excellent method for the removal of tonsillar tags and recurrent lymphoid tissues.

The use of local and general ultraviolet radiation for tuberculosis of the pharynx or larynx is always mentioned in the literature on the subject. Actually in the Municipal Tuberculosis Sanatarium of Chicago it is not used for this purpose. This is mainly due we believe to the fact that results are only secured if the ultraviolet radiation is applied directly to the lesion. This usually requires a technic that takes considerable time of a physician and equal results can be secured by less time consuming treatment. Ultraviolet radiation cannot be satisfactorily applied to the larynx by a patient using a mirror or by a technician.

The indications for electrosurgery in throat conditions have recently been summarized by Hollander[8] and time will not permit their consideration here.

In conclusion it is desired to emphasize that the Council on Physical Therapy of the American Medical Association investigates apparatus used in physical therapy. For the protection of the patient and physician no machine should be used in physical therapy which has not been accepted by the Council. From time to time the Council publishes articles on the use of physical agents giving conservative views on the subject and the Secretary will always answer questions on the use of new or old physical agents in any special field.

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DISCUSSION

Dr. A. B. Middleton, Pontiac: I agree with everything Dr. Coulter has said. This Section is certainly fortunate to have this paper.

Dr. A. R. Hollender, Chicago. I do not quite agree with Dr. Middleton that a paper of this kind will be publicized to the extent of doing harm. If such were the case other papers would be subject to the same disposition. This paper is especially instructive because it comes from the authority of one who is not primarily a laryngologist. Dr. Coulter's views are conservative and I agree that they should be. I should like to emphasize the value of infra-red radiation. This is a form of therapy which is very valuable in rhinologic work, particularly in the acute infections. In this connection I wish to say a word about short wave diathermy. While our knowledge of the subject is still limited, I am confident that the future will bring forth revelations which will force many of us to modify our present orthodox procedures. With reference to the use of diathermy in the antrum, the experimental work of Dr. Coulter is indeed interesting. While the temperature is raised only slightly this is not an index of possible clinical results. It has been shown by various workers that there are very favorable structural changes produced by the local application of electrical heating.

Whether short wave diathermy is of value in sinus-

itis, further experimental evidence will be required to prove. In the acute cases it relieves pain and promotes drainage, but in the chronic conditions much depends on the nature of the pathologic process. The resumé which Dr. Coulter presented is indeed a rational exposition of the subject of physical therapy as applied to the ear, nose and throat.

Dr. O. B. Nugent, Chicago: I would like to say a word about the local application of ultraviolet. Failure so often results because the presence of excretions which prevents the ultraviolet ray from reaching the parts to be treated. I have been preaching this gospel for many years and this is the first time I have heard it mentioned except by myself. Recently I called on a well-known ophthalmologist in another city. He had an ultraviolet apparatus and had not been able to get good results with its use in corneal ulcers. I asked him three questions: 1. If he knew the distance he treated from; 2. If he was sure he had the corneal ulcer cleaned; 3. If he was sure of the length of the exposure; otherwise he could not expect results. He had not paid much attention to those points. I have heard from him since and he said he had revised his methods and was getting much better results, and he felt this was because he had cleaned the ulcer before starting the treatment, and paid more attention to the length of the treatment and the distance from the parts to the generator.

Dr. J. S. Coulter, Chicago (closing): I have nothing further to add except that short wave medical diathermy has more penetration than contact metal electrode diathermy but no other effect than that of heat. In spite of all the claims, short wave medical diathermy is heat; the physical effects are just from the heat produced in the body tissues.

THE ADVANTAGES AND DISADVANTAGES OF ASPIRIN AND ASPIRIN WITH CALCIUM SALTS IN THE TREATMENT OF ARTHRITIS

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Introduction. Eighty patients with various forms of arthritis were studied clinically from January 24, 1935, to August 1, 1935, in the arthritis division of the Mandel Clinic of the Michael Reese Hosiptal. Forty-six patients were followed for a period of four consecutive months. All of the patients had marked objective and subjective findings so that from the clinical point of view the results obtained from the treatment could be considered a severe test of its efficacy. Close records were kept of subjective and objective improvement, as well as of gastrointestinal and other symptoms which may have developed as a result of the medication.

From the Arthritis Unit of the Mandel Clinic of the Michael Reese Hospital. Aided by a grant from the Wodlinger Fund.

Classification of Patients. The patients were divided into four groups depending on the type of arthritis which they had. These included hypertrophic, atrophic, mixed arthritis and gouty arthritis. The hypertrophic group included 35 patients ranging in age from 40 to 73 years, with a duration of symptoms of from six months to twenty years. The atrophic group included six cases with an age range from 26 to 48 years and duration of symptoms of from two and one-half to nineteen years. In the mixed group there were four cases ranging from 40 to 68 years with a duration of from six months to 37 years. There was but one case of gout, present in a patient 55 years of age for four years.

Practically all of the patients had disorders other than arthritis—these included the following:

TABLE 1

Diagnosis	No. of Cases
Obesity	3
Arteriosclerosis	3
Hypertension	7
Cardiac	3
Short epsophagus	2
Erythema multiforme	1
Spastic colon	4
Peptic ulcer	1
Biliary tract disease	6
Menopause	3
Neurosis	1
Psoriasis	1
Senility	1
Varicose veins	3
Emphysema	1
Multiple scleroses	1
Diabetes mellitus	7
Nasal sinus infection	1
Chronic otitis media	1
Pulmonary tuberculoses	1
Generalized pruritus	1

Method of Study. The reactions of the patients during four consecutive four week periods of medication were studied. Insofar as tolerance of the patient for the medication allowed, each period was like the preceding one in the dose of the drug employed. During the greater part of the study one tablet four times a day was administered. For the first four week period the tablet consisted of four grains of acetylsalicylic acid and two grains of calcium gluconate. During the second four week period the tablet was made up of four grains of acetylsalicylic acid and two grains of starch. For the third four week period, the tablet of aspirin and calcium gluconate was again employed, while during

the fourth study period the tablet contained four grains of acetylsalicylic acid and one-half grain of tricalcium phosphate. This amount of tricalcium phosphate yields the same amount of calcium as was found in the calcium gluconate tablets. In some cases the dose was increased to two or even three tablets four times a day. Each patient was seen once a week, if possible. In the large majority of cases they were examined at least once every two weeks, while in a few instances they were seen only every three weeks. No other medication or treatment was used other than the preparations of aspirin and aspirin and calcium compounds. The tablets used were all of the same size and appearance, and the patients were not informed of the character of the medication nor of changes from one type to another during the four months of study.

Table 2 shows the effect obtained in the relief of pain during the four periods of study.

TABLE 2

Relief of Pain—Entire Group of 46 Patients

		Per Cent.
1. Calcium Gluconate-Aspirin		
Better	32	69.5
Same	14	30.5
Worse	0	0.0
2. Aspirin		
Better	35	76.1
Same	9	19.6
Worse	2	4.3
3. Calcium Gluconate-Aspirin		
Better	34	74
Same	9	19.6
Worse	3	6.4
4. Calcium Phosphate-Aspirin		
Better	25	54.3
Same	7	15.2
Worse	13	28.3
Inadequate Dosage	1	2.2

Tables 3, 4 and 5 show the effects obtained in the relief of pain in the hypertrophic, atrophic and mixed groups.

TABLE 3

Relief of Pain—Hypertrophic Group—35 Patients

1. Calcium Gluconate-Aspirin		
Better	25	71.5
Same	10	28.5
Worse	0	0.0
2. Aspirin		
Better	27	77.2
Same	7	20.0
Worse	1	2.8
3. Calcium Gluconate-Aspirin		
Better	25	71.5
Same	8	22.8
Worse	2	5.7
4. Calcium Phosphate-Aspirin		
Better	18	51.4
Same	6	17.3
Worse	11	31.3

TABLE 4

Relief of Pain—Atrophic Group—6 Patients

1. Calcium Gluconate-Aspirin		
Better	3	50
Same	3	50
Worse	0	0
2. Aspirin		
Better	4	66.7
Same	1	16.6
Worse	1	16.6
3. Calcium Gluconate-Aspirin		
Better	5	83.3
Same	0	0.0
Worse	1	16.6
4. Calcium Phosphate-Aspirin		
Better	3	50
Same	0	0
Worse	3	50

TABLE 5

Relief of Pain—Mixed Group—4 Cases

1. Calcium Gluconate-Aspirin		
Better	3	75
Same	1	25
Worse	0	0
2. Aspirin		
Better	3	75
Same	1	25
Worse	0	0
3. Calcium Gluconate-Aspirin		
Better	3	75
Same	1	25
Worse	0	0
4. Calcium Phosphate-Aspirin		
Better	3	75
Same	1	25
Worse	0	0

The one patient with gout showed improvement from the beginning to the end of the treatment period.

Conclusion as to Arthritic Symptoms. Objective improvement was noted in the form of decrease of joint swelling, tenosynovial thickening and increase in joint motion. After a period of medication during which the severity of the symptoms remained constant, cessation of medication was always followed by aggravation of the symptoms.

Medication with calcium phosphate-aspirin usually produced a decrease of improvement.

Conclusion. Medication with salicylates brought about definite symptomatic improvement in the majority of forty-six patients with severe arthritis treated over a period of four months.

The Production of Gastrointestinal Distress by Salicylate Medication. It is well known that salicylate medication produces gastrointestinal distress in a number of those in whom it is employed. It is important to know the influence of the salicylates in persons who have never

had gastrointestinal distress and in those who have definite gastrointestinal pathology.

The patients with arthritis were closely observed for the development of such symptoms as heartburn, bloating, epigastric soreness, nausea, emesis and cramps during the period of medication. In some instances such severe disturbances resulted as to cause the patients to refuse to continue with the medication—these we have listed as ultra symptoms.

Table 6 shows the number of patients in whom the gastrointestinal symptoms developed with the various forms of medication employed.

TABLE 6

SUMMARY

	Calcium Gluconate-Aspirin	Aspirin	Calcium Gluconate-Aspirin	Calcium Phosphate-Aspirin
Heartburn	15	13	13	9
Bloating	3	5	4	2
Soreness	9	14	5	10
Nausea	11	16	7	9
Emesis	3	4	3	5
Cramps	5	14	5	15
Ultra	0	3	0	6
	46	69	37	56

The following peaks are noted:

Heartburn—Calcium Gluconate-Aspirin.....15 times
Bloating—Aspirin ..... 5 times
Soreness—Aspirin .....14 times
Nausea—Aspirin .....16 times
Cramps—Aspirin .....14 times
Calcium Phosphate-Aspirin.....15 times
Emesis—Calcium Phosphate-Aspirin..... 5 times
Ultra—Calcium Phosphate-Aspirin..... 6 times

A perusal of Table 6 shows that during treatment with calcium gluconate-aspirin the milder group of gastrointestinal symptoms such as heartburn occurred more frequently than severe symptoms such as nausea and cramps, whereas with aspirin this condition was reversed. Calcium phosphate-aspirin acted much as did plain aspirin. In addition the total number of gastrointestinal complaints was greater with aspirin and calcium phosphate-aspirin than with calcium gluconate-aspirin. We therefore believe it fair to state that greater gastrointestinal distress, both qualitatively and quantitatively, occurred with the use of aspirin or calcium phosphate aspirin than with calcium gluconate-aspirin.

Tables 8, 9 and 10 show the gastrointestinal symptoms which developed in patients with gastrointestinal pathology during the four periods of treatment.

TABLE 7

BILE TRACT DISEASE—6 PATIENTS

	Calcium Gluconate-Aspirin	Aspirin	Calcium Gluconate-Aspirin (2)	Calcium Phosphate-Aspirin
Heartburn	2	2	1	2
Bloating	1	0	0	0
Soreness	2	2	1	1
Nausea	1	2	1	3
Emesis	1	1	0	0
Cramps	0	3	1	4
Ultra	0	1	0	1
	8	11	4	11

The study of cases with bile tract disease (chronic chole-cystitis, cholelithiasis and post-operative cases) reveals the same relative findings noted in Table 6.

The findings in those with spastic colon as shown in Table 8 also confirmed the results obtained with the entire group of forty-six patients.

TABLE 8

SPASTIC COLON—4 PATIENTS

	Calcium Gluconate-Aspirin	Aspirin	Calcium Gluconate-Aspirin	Calcium Phosphate-Aspirin
Heartburn	2	2	1	1
Bloating	0	0	0	0
Soreness	1	1	0	0
Nausea	2	2	1	0
Emesis	0	0	0	0
Cramps	2	2	1	3
Ultra	0	1	0	1
	7	8	3	5

PEPTIC ULCER—1 CASE

Calcium Gluconate-Aspirin (1).....Soreness
Aspirin .....Soreness and cramps
Calcium Gluconate-Aspirin (2).....Heartburn
Calcium Phosphate-Aspirin.....Cramps

TABLE 9

SHORT ESOPHAGUS—2 PATIENTS

	Case 1	Case 2
Calcium Gluconate-Aspirin	Heartburn	Soreness Nausea Cramps
Aspirin	Heartburn	None
Calcium Gluconate-Aspirin (2)	Soreness Emesis	None
Calcium Phosphate-Aspirin	Soreness Emesis	None

In this small group calcium gluconate-aspirin produced the most distress, calcium phosphate-aspirin the next and aspirin the least.

TABLE 10

MISCELLANEOUS TABLE

	Calcium Gluconate-Aspirin	Aspirin	Calcium Gluconate-Aspirin (2)	Calcium Phosphate-Aspirin
Dizziness	10	11	18	18
Ultra Severe (Cease) Dizziness	2	0	3	1
Urticaria	5	11	9	11
Tinnitus Aurium	0	3	7	2
Precordial Pain	6	10	4	5

TABLE 11

STUDY OF PATIENTS WITH HYPERTENSION

	1	2	3	4	5	6	7
Calcium Gluconate-Aspirin	0	0	0	Precordial pain	Precordial pain and dizziness	0	0
Aspirin	Precordial pain		Precordial pain	Precordial pain	Precordial pain	0	Dizziness
Calcium Gluconate-Aspirin (2)	Dizziness	0	Dizziness	Dizziness	Dizziness	0	Dizziness
Calcium Phosphate-Aspirin	0	0	Dizziness	Dizziness	Dizziness	Dizziness	Dizziness

Dizziness. One of the first symptoms of salicylization is dizziness. It is evident from Table 10 that quantitatively calcium gluconate-aspirin and calcium phosphate-aspirin produce more dizziness than ordinary aspirin. Several individuals had such severe dizziness with calcium gluconate-aspirin that they could not continue with the medication. They complained not only of dizziness but also of sweats and flushes of such a degree that everything "swam around them." If we accept these symptoms as evidence of salicylization, then the results indicate that calcium gluconate-aspirin produces more salicylization than does an equal amount of aspirin. Therefore, smaller doses of calcium gluconate-aspirin than of aspirin should afford relief from pain.

Urticaria. Urticaria is considered an allergic phenomenon. It developed less frequently as shown by Table 10 with calcium gluconate-aspirin than with aspirin and calcium phosphate-aspirin.

Tinnitus Aurium. This symptom developed in only a few instances. It is difficult to draw definite conclusions from it, unless it is interpreted as a further indication of salicylization.

Precordial Pain. During treatment with aspirin more than double the number of patients developed precordial pain than during the treatment with calcium gluconate-aspirin or calcium phosphate-aspirin.

Table 11 shows the results obtained in seven patients with hypertension.

This table shows definitely that aspirin produces precordial pain much more frequently in hypertensive individuals than does either calcium gluconate-aspirin or calcium phosphate-aspirin. With the latter two types of medication dizziness, a symptom of salicylization, appears more often.

Conclusion. Acetylsalicyclic acid brings symptomatic and objective improvement in severe cases of arthritis. Calcium gluconate acetylsalicylic acid or plain acetylsalicyclic acid are more efficacious than calcium phosphate acetylsalicylic acid.

While calcium gluconate-aspirin and plain aspirin seem to be equally advantageous in the treatment of arthritis, calcium gluconate aspirin tends to produce fewer and milder symptoms in the gastrointestinal and circulatory systems. Furthermore, calcium gluconate-aspirin produces fewer and milder side symptoms in the equilibrial system than does plain aspirin or calcium phosphate-aspirin. Therefore, in prolonged medication for arthritis, calcium gluconate-aspirin is more advantageous than plain aspirin.

Calcium gluconate-aspirin produces more evidence of salicylization than does plain aspirin of the same dosage and about the same salicylization as does calcium phosphate-aspirin of the same dosage.

THE ETIOLOGIC, DIAGNOSTIC, AND MEDICOLEGAL PROBLEMS OF OCCUPATIONAL DISEASES

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The etiologic, diagnostic and medicolegal aspects of occupational diseases have in the past and will continue in the future to present difficult and serious problems to the practicing physician. There are good reasons for believing that the whole situation will become more complicated rather than more simple. Furthermore, the factors involved are deeply woven into the fabric of our whole social and economic structure.

Read before Section on Public Health & Hygiene of Illinois State Medical Society, Springfield, May 20, 1936.

The real basis for the neglect of the technical and administrative aspects of occupational disease problems lies deeply rooted in our legislative experience. Compensation laws originally, at least in most states, made no provisions whatever regarding the occurrence of occupational diseases, but confined the regulations almost entirely to the problems of accidental injuries. As a result, traumatic surgery was greatly stimulated and there arose a considerable body of professional and lay persons who are thoroughly qualified on injuries, or became so because of the legal requirements.

Not so with occupational diseases, however, for the great majority of professional and lay groups in this country, at least so far, have been concerned only with those things which are required by law. Further proof of the vital importance of the situation can be adduced however when one knows that in the year 1935 there was introduced in more than forty states proposed legislation relative to the compensation of occupational disease disability.

Silicosis, about which we have heard a great deal more than we have actually seen in recent years, probably has made the general population occupational - disease - conscious, but there are other important occupational diseases deserving of serious consideration. Even with all the consequent grief attached, probably the silicosis situation may have a definite salutary effect, in stimulating action regarding the whole question of occupational diseases.

The purpose of this paper is merely to point out rather briefly some of the difficulties that have been encountered in the etiologic, diagnostic and medicolegal problems of occupational diseases and to suggest also rather briefly measures which will tend to relieve these difficulties.

Etiology. Etiology has been a most neglected factor as evidenced by the repeated review of medical records of hospitals, dispensaries and private physicians. The chief error committed in this respect has been to assume that because the patient gives a history of exposure to dust, for instance, that he must be given a provisional diagnosis of silicosis, regardless of the kind and amount of dust to which he has been exposed, and too often the word "provisional" is omitted. Perhaps most often this error has been committed because of reliance upon unproved statements made by the patient and recorded in the history. This state of affairs is equally true of other occupational diseases.

The fact remains, as the U. S. Public Health Service has definitely shown in its excellent industrial hygiene studies in different industries, that mere exposure to potentially harmful substances does not constitute a hazard. Industrial conditions must be critically studied and measured before correct diagnosis can be made. We might take a lesson from our epidemiological friends so well written in the pages of the history of the control of communicable diseases; in establishing the etiology of occupational diseases, we might well apply the same carefully controlled and scientific procedures which have resulted in such definite etiological information being established in relation to the problems of communicable diseases.

One of the fallacies into which we have easily fallen (and which has also been repeatedly committed by inspectors, engineers and employers) has been reliance on visual inspection of industrial conditions. These methods have and will continue to be efficacious in the control of accidental injury hazards, but no one has yet been able to prove that you can by looking at a cloud of dust tell how much free silica or quartz it contains, or how much lead, carbon monoxide gas, sulphur dioxide, trichlorethylene vapor, or benzol vapor there is in the air merely by visual inspection. In other words, the common causative factors of occupational diseases are what may be called "hidden hazards." It is only by resorting to scientific methods of measurement that an adequate and proper estimate of the type of exposure may be obtained and one may then tell whether there is a real occupational disease hazard present in the industrial environment or not. This conclusion can be arrived at by the comparison of the findings in any given industrial environment with established criteria which have been previously set up through the research work of various organizations, notably the U. S. Public Health Service and the U. S. Bureau of Mines, as well as many other groups and individual investigators.

It is not expected that the physician become an engineer, but it is respectfully recommended that he take interest enough and inform himself sufficiently so that he will learn to establish etiology in occupational disease problems upon just as scientific a basis as has been previously

used in regard to similar situations in communicable diseases where bacteriology plays so prominent a part, and also in surgical diseases or injuries in which the mechanism of the provocative agent has been thoroughly studied and demonstrated.

Another phase of the etiological aspects demands our attention for a moment: it has always been acknowledged by the laity that diagnosis and treatment are the essential prerogatives of the physician. One does not, however, find especially in relationship to occupational disease problems and other similar problems, a like conception on the part of the laymen in regard to the etiology. It is true that in many instances, the knowledge of the physician must be supplemented by that of the engineer. We should be careful however that too great encroachment is not made upon the rights of the individual practitioner in this regard. It might be interesting to note in passing that some twelve or thirteen states are now considering the establishment of bureaus of industrial hygiene, mostly in the departments of health of the states, for the purpose of working out some of these etiological problems in regard to occupational disease. The establishment of these bureaus has been made possible by the provisions of the National Social Security Act in allocating funds in most instances upon a dollar for dollar basis for use in this projected work. It is hoped that these bureaus and their relationships will be very definitely guided and directed by medical influence and advice. It is my belief that these etiological problems are just as much within the province of the physician in regard to occupational diseases as are such matters in regard to nonindustrial diseases. It is difficult to understand how proper diagnosis and treatment may follow unless etiological information is based upon methods of precision and also properly interpreted and applied to the diagnostic findings and the treatment principles.

Diagnosis. The diagnosis of occupational diseases presents a problem not less difficult than that concerned in the etiology, in fact in some respects the difficulties are greater. The first consideration here as has been indicated is a clear picture of the etiological relationships so that there may be established cause and effect phenomena as demonstrated by the causative factors in the industrial environment, and as manifested by the effects on the human body as shown by clinical data. Diagnosis involves not only searching and adequate examinations with appropriate history which should be detailed, but also pertinent clinical laboratory and x-ray information, as well as differential opinion. And it is in this differential opinion that great care must be exercised, for the differential diagnosis of occupational diseases from nonindustrial maladies will always be a difficult clinical problem. The source of the difficulty here lies in the fact that the symptomatology and frequently the physical findings in occupational diseases imitate so closely the symptomatology and physical findings of nonindustrial diseases. One must, therefore, make use of specific procedures which are designed especially as diagnostic guideposts. To give a number of examples: Dr. George Gehrmann in a recent paper on "Papilloma and Carcinoma of the Urinary Bladder in Dye Workers," called attention to the fact that these pathological lesions differed in microscopic structure in no way from similar tumors of the bladder of unknown etiology; it is therefore important to determine what the exposure has been in these instances and to know the nature and the concentration of the substances which may produce these tumors, establishing the facts by scientific investigation and intelligent interpretation. It is also a well-known fact in the consideration of lead cases, that the symptomatology and the physical findings often imitate other diseases and furthermore that an appreciable amount of lead may be ingested in the daily diet from the eating of common foods; this calls for a measurement of the amount of lead in the air to which the employee was exposed and furthermore the intelligent use of the McCord test for basophilic aggregations in the blood, since positive findings have been proved to indicate lead absorption before real intoxication occurs. Quite recently Schrenk and Yant of the Bureau of Mines of Pittsburgh have devised a urinary test for inorganic sulphates specifically adapted to tests on workers exposed to benzol vapor. This procedure is really a measure of the exposure rather than a help in diagnosis, but no doubt will be extremely valuable.

Because the great majority of occupational diseases which are most disabling and therefore

of most economic importance are caused by the inhalation of various kinds of injurious substances, a great deal of emphasis will no doubt be given to the examination of the effects of the inhalation of such substances upon pulmonary tissue, upon the blood and upon the excretions. A great many procedures are now at our disposal for the purpose of examination of the body and its fluids, but undoubtedly great impetus will be given to this part of our diagnostic armamentarium.

Pre-employment and periodic examinations are really diagnostic problems, for it is the purpose of these examinations in industry to establish by medical opinion and judgment the status of the human body and to say whether the individual is capable of going into industry and pursuing his occupation or can continue with some occupation where it is known that a real hazard exists. One cannot help but believe, after reviewing records from various portions of the country and in different industries, that the preemployment and periodic physical examination procedure must undergo considerable adjustment and improvement if good results are to be obtained in the specific adaptation of these procedures to industrial problems. This principle has been very successfully followed by the railroads and there is no reason why similar improvement cannot be made in reference to occupational disease problems.

One wonders also whether the examining physician could not be of greater service and give more efficient advice regarding acceptability for employment or continuance in it, if he was conversant with the following three things: 1. the nature and extent of the industrial exposure into which the employee will go or has been; 2. the effect of this specific exposure upon the normal and abnormal physical states of employees, as interpreted by the physical status of the individual on examination; and 3. the nature of the protective devices supplied by the employer and as to whether these devices are functioning efficiently. It is realized that these procedures are somewhat out of the present program of physical examination, but it is also expected that the physician will be more and more called upon to know and appreciate such information, so that he may function better as a diagnostic medium.

Medicolegal Problems. The chief medicolegal issues in occupational disease problems arise because of deficiency in etiological information, and consequent errors in diagnosis. Reduced to simple terms, the industrial commission or the arbitrating body in considering any individual case, essentially wants to know whether the claimant became disabled because of the contraction of an occupational disease, what the nature and extent of his disability is, whether he actually has the occupational disease alleged, and whether he contracted that occupational disease because of peculiar circumstances definitely associated with his occupation and its industrial environmental influences. Let me say here that the wise employer has no intention of evading compensation for actual and typical occupational disease disability, but should not be compelled to pay for nonindustrial disease disability which has no definite relationship to employment. Similarly, the employee has every right to expect that he can labor in the process of making his living without undue industrial hazard; but he may not and should not expect to draw compensation for disability due to diseases of nonindustrial pursuits.

A great deal of divergence of opinion has arisen over legal and informal definitions of occupational diseases. Because it will be of interest to you and to many other physicians in this state as to what the legal requirements in Illinois are going to be on this subject, I shall take the liberty of quoting to you from Section 6 of the Workmen's Occupational Diseases Act as passed unanimously by the 59th General Assembly at the Third Special Session this year, and effective October 1, 1936:

"Section 6. In this Act the term 'occupational disease' means a disease arising out of and in the course of the employment. Ordinary diseases of life to which the general public is exposed outside of the employment will not be compensable, except where the said diseases follow as an incident of an occupational disease as defined in this section.

"A disease shall be deemed to arise out of the employment, only if there is apparent to the rational mind upon consideration of all the circumstances, a direct causal connection between the conditions under which the work is performed and the occupational disease, and which can be seen to have followed as a natural incident of the work as a result of the exposure occasioned by the nature of the employment and which can be fairly traced to the employment as the proximate cause, and which does not come from a hazard to which the

workmen would have been equally exposed outside of the employment. The disease must be incidental to the character of the business and not independent of the relation of employer and employee. The disease need not to have been foreseen or expected but after its contraction it must appear to have had its origin in a risk connected with the employment and to have flowed from that source as a rational consequence."

It is believed that when studied even superficially, the language of this section, from which the physician may determine the legal point of view as to what constitutes an occupational disease in this state, also demonstrates why emphasis has been placed on the etiological relationships of occupational diseases and the importance of medical diagnosis and differential opinion.

It is not possible to go into the minute details of occupational disease problems in this paper, but it is thought that enough has been given to indicate what the major problems now are and may be in the future, for the physician who is called upon to render service in this field. Perhaps it is not too much to say that the medical profession must extend its influence and basic knowledge in occupational disease work if usefulness is to be continued and preserved.

Summary. In summary, we may conclude that:

1. It will be to the best interests of the medical profession as a whole that the physician who does occupational disease work take a great deal more interest in acquiring definite information regarding the nature and severity of industrial exposure as an etiologic factor in the production of occupational disease.

2. Diagnosis, as difficult as it may be in some instances, can be made more definite by the application of specific procedures designed as diagnostic guideposts. Differential opinion will more and more play a decisive role in diagnosis and will be of considerable value medicolegally.

3. Especial attention should be given to the evaluation of exposures in industry occurring through inhalation, because of the presence or evolution of dusts, fumes, gases, or vapors. The measurement of the effects of such inhalation upon the human body and the interpretation of these effects will become increasingly important not only as scientific medical groundwork in occupational diseases, but also in application to medicolegal problems.

4. Pre-employment and periodic examination technique must undergo some change and improvement before it will be possible for the physician to give the service which he is really capable of giving and should give in relationship to industrial experience.

5. Passage of compensation laws compensating for disability due to occupational diseases will require more definite information concerning the kinds and amounts of industrial exposure and will emphasize the necessity for the establishment of cause and effect relationships pertaining to industrial exposure and the manifestation of such exposure in the human body.

6. Greater opportunity for the study of industrial environment and clinical material must be afforded not only to medical students, so that we may be bringing on "new blood," but also for the continued enlightenment of existing practitioners and further for the use of postgraduate demonstrations and teaching.

7. The medical profession must certainly look to its laurels, if it expects to preserve its integrity in the various phases of occupational disease investigation.

8. Finally, the standards of industrial medicine should be very definitely raised by the establishment of qualifications for the men who are to be the leaders in this field of medical endeavor and further, by the recognition of industrial medicine as a definite specialty by official medical groups identified closely with organized medicine.

DISCUSSION

Dr. Wm. D. McNally, Chicago: It is deplorable that we haven't more people present to hear this admirable paper which Dr. Sappington has just given us. This is a problem for the general practitioner. This room should have been filled to its capacity because in October the general practitioner will be very busy. Between now and October he should be acquiring an education along this line, and during the past half hour he has had an opportunity to lay a foundation for that education. The general practitioner sees the workman in industry first, the man doesn't come to see Dr. Sappington or myself, but somebody else. The general practitioner has a duty to protect the health of that patient; he also has a duty to protect the industry. Without industry our communities cannot continue to grow. We can see the effects of the shutdown of industry during the present depression. Some of the diseases that Dr. Sappington mentioned are depression diseases.

Silicosis was known for hundreds of years. Lead poisoning was known for hundreds of years. One of the first cases of silicosis which came to trial was in Chicago against the Western Electric, where I was

a witness, over twenty years ago. For a period of fifteen years we did not hear of silicosis. It was only about 1929 or 1930 that it began to develop as a menace to industry. Industry needed to be punished. We had been endeavoring for years to have them clean house, the foundries and other places, and even today we have that problem of trying to educate them in protecting the workmen against dust, against poisonous fumes, etc.

Now, under the heading of etiology, Dr. Sappington should have stressed the occupational history. His paper was one which covered a large amount of ground and he couldn't possibly include all these points. If he had more time I know he would have stressed this matter of occupational history. The general practitioner, when he sees a patient, may take his occupational history and take it with one word. He may record that this man was working in the automobile industry. That has no meaning inasmuch as there are many phases of the work without hazards and others with hazards. For example, take the metallic parts of the tops of cars that are welded together with a solder containing lead. The men engaged in this work use blow torches with which they melt the excess solder; during this process the fine particles of lead are thrown directly into the faces of men working opposite them four or five feet away. The same happens during the use of emery wheels or carborundum wheels, where a fine dust is thrown over towards the workmen on the other side, who may or may not be provided with a mask. An analysis demonstrated that lead dust in one industry extended for fifteen feet away from where a man was using the emery wheel. This industry provided the men with pig snout respirators but they refused to wear them. When the men become warm and perspiration appears on their faces, they develop a slight eczema or dermatitis while wearing these pig snout respirators and for that reason refuse to wear them. When going into the history of an individual it is important to find out what type of work he was engaged in, in that particular job. In a case before the Industrial Board this last winter a man had worked for the National Lead Company. His lawyer thought immediately that he was a handler of lead. It so happened that the man had worked in the boiler room. An examination of the air in the boiler room showed there was no lead whatsoever. The amount of carbon monoxide present was so small that he could not claim injury due to either of these causes. The lawyer on the other side then changed his plea to that of pneumonoconiosis, stating that the man handled ashes, and that coal dust was responsible for his condition. Fortunately, we had made an examination of the air and a quantitative determination of the dust, showing the amount of dust present per cubic foot in actual count and also a quantitative examination showing the amount in milligrams. So, we won the case simply by having more data than the other lawyer, both on lead, carbon monoxide and the dust count.

It is very necessary that an education along this line start with the general practitioner. He comes in contact with all these people and it is his duty to inform them of the hazards, if there are any, and also to instruct them as to how to protect themselves. If he is a physician for the industry, he should not hesitate to tell the general management of the hazards. They will listen to him today where they wouldn't a few years ago.

Now, under diagnosis, it is imperative that every possible test is made on some of these cases. A man may have been working in a dusty atmosphere, or even working in lead, but his history may show that long before he worked in lead he had a hyperacidity or symptoms of hyperacidity, or he may have had symptoms of an ulcer. From the history and x-ray pictures, you will find occasionally that you have a case in which a gastric or duodenal ulcer was present antedating the employment of this particular individual.

Take the blood count. A blood smear in chronic lead poisoning doesn't mean very much. An examination of thirty-two men three weeks ago who had been exposed to lead failed to show basophilic stippling in the smear by the McCord method, yet these same individuals had a content of 0.07 to 0.39 milligrams of lead per liter of urine. All this lead was being excreted. So, in chronic cases don't depend upon the direct blood smear to show absorption. Have a chemical examination made of the urine to show the amount of lead elimination. The clinical examination is very important also. The patient may show lead excretion without any of the cardinal symptoms of lead intoxication. A card index should be made of every individual coming into a factory.

The doctor spoke of the preoccupational examination. Some industries don't want it because they fear that those who are already employed may think there is something wrong with them that perhaps they have silicosis or lead poisoning and may bring suit. These men, however, if employed regularly never bring suit. I can safely say that 90% of the cases in which I have testified were cases of men who had been discharged for some specific reason as inefficiency, drunkenness, etc., and then brought suit against the industry on some particular phase, such as silicosis, lead, benzol or some other factor.

A blood examination in chronic lead poisoning will always show a low hemoglobin and a low red count. The red count would be below 4,500,000. That should indicate to the industrial physician or to the general practitioner that something is wrong. Then you may investigate further by having an examination of the urine made. An examination of the blood is very important in benzol poisoning. Men who are working with rubber cement, rubber shoes or other rubber products inhale benzol. The quickest way to detect benzol poisoning is by the red count and the white count. This last summer I had one case who had a red count of 1,100,000 and a white count of 900. That individual died in spite of repeated blood transfusions and liver therapy. The urine will show an increase of sulphates in benzene poisoning.

Now, as to the medico-legal phase, you shall always find lawyers and shall always find doctors who are willing to take various sides of a case of alleged

poisoning by lead, arsenic, carbon monoxide or even silicosis. If we can educate the general practitioner as to what is a real hazard, and to make a diagnosis and keep records, we shall have fewer of these cases coming before the Industrial Board.

Many industries don't want postoccupational examinations. They fear that, if we make an examination of that individual and find something wrong, although the individual may not know it, others will quit work and bring suit against them. The easiest way to combat that is to say it is the requirement of the statute that the individual be examined and that the air or other hazards in the particular industry be investigated.

Dr. C. O. Sappington, Chicago: I want to thank Dr. McNally for his discussion and just briefly comment on some of the things that he mentioned. In the first place, he talked about the medicolegal phase. It may be very enlightening to know that in a considerable number of silicosis suits in which I have been privileged to serve as a medicolegal witness in different states throughout the country, I have never found a single actual case of silicosis in suit. That may be due to several reasons, but you can draw your own conclusions.

In regard to the etiology, it is true that the history should be stressed a great deal, as Dr. McNally said. Often I have run across the word "laborer" as the occupation, not only given on the death certificate but also given in the occupational history. Of course, you know that "laborer" means nothing from the standpoint of classifying the man as to what work he does.

Respirators were mentioned by Dr. McNally. They are very valuable adjuncts in the control of the inhalation of dust and noxious vapors, if we use the word respirator to mean any kind of protective respiratory equipment, but I want to impress upon you that the use of respirators or respiratory protective equipment of any sort is not a substitute for dust control, which is the real issue. Dust should be controlled at its source and no final reliance should be put upon any protective equipment, because there are many problems that arise in getting men to wear the various types of respirators. This does not mean that there are not specific instances where protective equipment is the real answer.

I should say to you briefly that it is necessary to know, before you go in to a plant, what you are going to look for. I recall an interesting experience in which I was associated with the chief chemical engineer of a very important company in an industrial group in Chicago. We went out to see a plant where several reverberatory furnaces were used and, in discharging the slag at the end of the furnace, the slag was wet with water. As we stood looking at it, this chief chemical engineer of this important company said to me, "Doctor, I am very much concerned regarding the carbon monoxide and the methane in the air." I replied to him, "I would be very much concerned about the carbon monoxide but I would have no concern whatever about the methane because methane is physiologically inert." It is true that in certain quantities or in certain concentrations it is explosive but it has no effect upon the human body unless it exists in such tremendous proportion that it will produce oxygen deficiency.

At another time I was inspecting a plant in which lead was used in pots. It was poured out in pigs, to be used later, for various kinds of type. I was told by the employer that the insurance company would not accept insurance from this organization until it was definitely known whether there was lead in the air. The insurance inspector said he could see lead in the air. So we made measurements of the concentration of lead in the air and found no dangerous exposure.

Again, there was an incident in which the chief engineer for an insurance company reported to his company that the risk should not be accepted because of the fact that the men were dipping metal parts in aluminum and standing these metal parts up against the wall to dry after dipping them. The engineer said to the company, "You should not accept this risk because that's a health hazard and will cause an occupational disease." As a matter of fact, you probably all know that aluminum fumes are not toxic. There are many times that these sorts of decisions pervade the whole problem of occupational diseases.

In regard to the diagnosis of lead poisoning, and particularly with regard to the use of blood smears, I think they are quite valuable under certain circumstances, but they should be considered, as I stated in my paper, through an intelligent use of the McCord test for basophilic stippling. If we measure the amount of lead excretion in the urine or feces, or both, that one examination means nothing. But, as I stated in my paper, the common articles of diet have an appreciable amount of lead in them, and, if you ingest that lead, you can't tell which is industrial and which is not. Therefore, there is no way of fixing the responsibility, which seems to be one chief problem we have on our hands today.

I, therefore, believe firmly, in the light of the work of Kehoe and others, that histories in these cases are necessary if you are going to make a scientific check-up of the amount of lead excretion in the urine or feces, or both.

Regarding benzol exposure, as I stated to you, Schrenk and Yant, of the Bureau of Mines of Pittsburgh, have devised a urinary test for inorganic sulphates. That's useful in finding out whether there has been an exposure to benzol vapor or not, before the blood shows any change in the white and red cells or the platelets. I didn't say that in my paper and I apologize to Dr. McNally for not saying it because, otherwise he wouldn't have brought up this question. However this test is a measure of the exposure before any pathologic effects have been noted on the men exposed and I believe therefore is of tremendous value.

The problem of examinations in industry will always be with us. I am inclined to believe that more and more men will be examined whether they like it or not. That's neither my making nor your making. I believe physical examinations will continue to be instruments of great help in deciding what kind of material industry is accepting from which to check the effects of ex-

posure in industry as to what that material is doing and how it is reacting. I believe there will be continued improvement in the technique of pre-employment examinations.

ACCIDENTS AND ERRORS ENCOUNTERED IN THE INCISION FOR EXTRACTION OF SENILE CATARACT

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It was my original intention to discuss the accidents and errors which might arise during the course of a cataract extraction, but after giving the subject some little thought and much reflection, I soon concluded that the time allotted would barely permit me to cover, even superficially, the first step in the operation proper, namely the incision. It is, therefore, of the accidents and errors which one encounters during this first step in the extraction of senile cataract of which I intend to speak.

An uncomplicated incision is not such a commonplace occurrence after all. If there is anything more gratifying than the feeling which a surgeon experiences at the termination of a classic incision, it is the feeling of satisfaction that he may realize following a well-managed complicated incision which he is fortunate enough to bring to a successful termination.

Untoward accidents, as we all know, may occur at each and every stage of the operation and in some rare instances, one may feel, at the conclusion of the operation, that at least one complication has hampered him during every step of the procedure.

One of the most annoying complications is to encounter a friable conjunctiva. This is particularly disconcerting if the conjunctiva does not tear until after the puncture has been made. If the conjunctiva proves to be friable, there is no good in attempting conjunctival fixation at another place. The best procedure to follow has been, in my experience, to immediately transfer the point of fixation to the superior rectus muscle. This shift can be easily and quickly accomplished and especially so if a bridle suture is in position. Personally, I prefer conjunctival fixation. Scleral fixation has its advantages but I am sure that many surgeons using this method of fixing the globe find the lens much easier to dislocate with forceps, suction or pressure, for the simple reason that they have dislocated the lens in their attempt at firm scleral fixation. Because of this fact, scleral fixation might well be considered an advantageous method. There are surgeons who, not only use a bridle suture on the superior rectus, but also on the external rectus, thereby securing reasonably good fixation without forceps in case the conjunctiva should tear.

I am certain of one thing, however, that in the first attempt at fixation, if the conjunctiva should tear, the proper procedure is to resort to scleral fixation immediately, providing the puncture has not been made. Should the conjunctiva, however, be so deceitful as to not display its friability until the tip of the blade is in the anterior chamber, I am equally confident that immediate transfer of fixation to the superior rectus is the wise course to follow. In rare instances when conjunctival fixation has failed me, I have been fortunate enough to have a patient, by his own volition, and aided by a bridle suture in the superior rectus, look strongly downward and permit successful termination of the incision.

The so-called intralamellar incision is a possibility of course, but hardly a complication to be expected even in semi-experienced hands. We all know that a very shallow anterior chamber would be conducive to this type of error. Every surgeon should be permitted once in his career to introduce the knife with the cutting edge downward. Should this mistake be made, there are two methods of procedure open to the operator. The wisest measure would be to withdraw the blade and postpone the operation to another date. However, it is surprisingly easy to flip the knife blade quickly through 180 degrees and proceed with the incision.

Any operator who has done much cataract surgery must surely be familiar with the numerous perils connected with the making of the incision and I am sure that few will deny that it is the most important part of the operation and upon this procedure depends mainly the favorable outcome of the operation. A surgeon may excuse himself later in the dressing room for having

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Chairman's Address, Section on Eye, Ear, Nose and Throat, Eighty-sixth Annual Meeting, Illinois State Medical Society, Springfield, May 20, 1936.

made a faulty puncture. However, one may enter the tip of the knife too far forward into the cornea or too far backward into the sclera and in either instance it becomes very difficult to bring the incision to a successful close. The proper site of the puncture is 1½ to 2 m.m. above the horizontal meridian at 9:47 o'clock, if you wish to put it that way, and 1 m.m. posterior to the sclerocorneal junction.

As the puncture is made, there should not be the slightest hesitancy in passing the knife blade through the anterior chamber. If at this point, either fixation fails or the iris becomes engaged in the tip of the blade, hesitation in instances, is not only permissible, but in my opinion is occassionally indicated. However, one should be careful not to withdraw the knife blade in the least during this period of hesitation as the loss of aquaeous will immediately follow, and one might, because of this accident, perpetrate an even greater injury. In the instance of complete withdrawal of the knife the operation should be postponed to a later date. Injury to the iris is usually painful even under the best possible anesthesia, and moreover, it should be carefully avoided for the reason that it is often responsible for more serious complications. The hemorrhage which attends this accident is particularly annoying and the pain is more than likely to produce an unruly patient.

Should one be so unfortunate as to engage the iris with the tip of the knife, it is best to lift the tip of the blade quickly by depressing the scalpel handle and carry on the incision to an immediate conclusion. If only a few fibers are engaged, they are cut through easily and one may be surprised to find that the iris has not been visibly damaged. The unfortunate end result of a serious engagement of the iris is an iridectomy much wider than the surgeon might desire.

The knife in all instances must be carried through the anterior chamber parallel to the iris. If fixation remains good and the iris has been hurdled successfully, it is then time to make the counter puncture. I suppose one might say that under good working conditions, a faulty counter puncture is rare, but I will venture to state that the best of surgeons are guilty of this error on occasions. Counter puncture made too far forward into the cornea makes for a shortened incision and delayed healing. One made too far posteriorly into the sclera makes a difficult stiff incision with much hemorrhage. Counter puncture a slight degree anteriorly is not a serious error but one made much too far backwards, is fraught with doleful possibilities.

Incisions well within the cornea are slower in healing and in subsequent dressings are liable to break open—an accident quite conducive to iris prolapse. My rule has been to effect the counter puncture at the time when the tip of the blade barely becomes obscured from view.

After the counter puncture, comes, in my opinion, the really difficult part of the incision. Some surgeons use a sawing motion in long or short sweeps in the horizontal plane. This method has its advantages but its advocates will admit that the iris is quite likely to be injured by the cutting edge of the knife blade. A second and better method is to depress the handle at the moment the counter puncture is made, and to thrust the blade almost to the hilt, thereby sweeping the tip upwards using the point of puncture as a fulcrum and finish the incision on the next withdrawal motion if possible. In any event, it is wise to advance the cutting blade of the scalpel as rapidly as possible above the lower border of the pupil. There is less danger of losing aqueous and engaging the iris in using the incision just described. Long sweeping strokes are preferable to short choppy ones. Rotation of the cutting edge of the knife forward immediately when the cornea has been entirely freed at the limbus will avoid too large a conjunctive flap at the apex. Great care should be exercised not to get this flap too large. There is slight danger of making too large a conjunctival flap excepting at the apex of the incision. A large flap is conducive to prolapse of the iris. The ideal incision should be about 1½ m.m. conjunctival flap throughout the length of the wound from puncture to counter puncture with perhaps a 3 or 4 m.m. flap at the apex.

Presentation of vitreous may occur immediately at the conclusion of the incision. This accident is most likely to occur when the incision has been too deep and sclera is included in the incision at the apex of the wound.

While the actual delivery of the lens is a tense breath-taking moment and seems to the surgeon to be the critical moment—I would suggest that

the proper moment for breath-holding on the part of the surgeon should be during the time when he is making his section for the real foundation of a successful cataract extraction lies in the success of the incision.

Good firm lifting fixation without pressure, a clean uncomplicated incision of proper size with narrow conjunctiva flap which will permit the introduction of four or five sutures if deemed advisable, practically insures the surgeon that the extraction will be brought to a successful close.

It is needless to say that clear illumination is necessary in making a correct incision.

Watching a considerable number of ophthalmic surgeons impressed me with the fact that practically all of their surgical work is accomplished by manipulations of the fingers and wrist and I have been further impressed with the fact that practically all of these men operate without giving their forearm any support. A few years ago in watching a celebrated portrait painter at his work, I observed that he always did his painting by manipulation of his fingers and wrist but that in his finer touchings with the brush he used his fingers with some slight wrist motion and during this procedure he always gave his forearm full support.

This observation gave me a thought which I have put into practical use in my ophthalmic surgery. In the first place, I operate in the sitting position in a chair of usual height. The operating table which I designed and had made for me by V. Mueller & Company, is of sufficient height to bring the patient's eyes on a slightly higher level than my knees. The patient's eyes are 26 inches from the floor. This permits me to rest my forearms on the anterior surface of my thighs. This position does not hamper me in any of my movements and at all times I have a steady support which permits me to govern my finger and wrist movements much more accurately and steadily. I have found that in this position, there is no strain as there was in standing with the arms akimbo—a position which is awkward and not conducive to delicate work.

I feel reasonably confident that by this method, I may be able to at least postpone the tremor which seems to be dreaded and feared by ophthalmic surgeons.

CHRONIC PROSTATITIS — A CRITICAL REVIEW OF 1000 CASES

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Introduction: This paper is based on a study of 1,000 unselected cases of chronic prostatitis, the records of which were taken from the private patients of one of us. (H.L.K.). It is a well recognized fact that the private patient suffering from chronic prostatitis affords a better opportunity for study than does the ordinary dispensary patient who is notoriously irregular in attendance, lacking in co-operation and usually discontinues treatment before he is discharged as cured.

Although chronic infections of the prostate are common, yet it is astonishing how infrequently this condition is searched for in the routine examination of patients, and still more significant is the frequency with which the prostate is overlooked in the routine search for a focus of infection. This oversight may be due to the fact that chronic infection in the prostate frequently does not produce local symptoms. As an example of the latter statement, let us cite the many cases of arthritis, iritis and neuritis, in which attention is not directed to the prostate until late in the course of the disease.

Etiology: In the earlier literature on the etiology of chronic prostatitis, many predisposing factors were mentioned that were supposed to have a direct bearing on the cause of this disease. Of these predisposing factors, sexual abuses, such as over-indulgence, withdrawal, masturbation and prolonged sexual excitement, were frequently observed. Furthermore, excessive use of alcoholic beverages was also given as an important place in the list of causes. It is difficult to prove or disprove whether or not any of these factors have any direct bearing on the etiology of chronic prostatitis. However, in this series of cases the above mentioned conditions played a relatively minor role.

Of the lesions in the prostate which predispose to and frequently are followed by chronic prostatitis, the most common is acute prostatitis which may be caused by either the gonococcus or other microorganisms. In recent years, espe-

cially since more careful bacteriological studies have been carried out, a surprising number of cases of non-specific prostatitis have been found. It is possible that some of these were formerly diagnosed as gonorrheal prostatitis.

The frequency of acute prostatitis as a complication of gonorrheal urethritis has been estimated by various authors as from 50 to 80%. Therefore, failure to recognize this complication and to institute proper treatment may justify the statement that untreated acute prostatitis, as a complication of urethritis, may be a factor in producing chronic prostatitis, or chronic prostatitis may be the direct result of a neglected or incompletely treated urethritis. Many authors are of the opinion that most cases of chronic prostatitis have this origin.

While it is a well known fact that infections of the prostate during the course of a gonorrheal urethritis occur in a large percentage of cases, it does not necessarily follow that all cases of chronic prostatitis are of gonorrheal origin. Thus, Young, in his series,[1] found a history of gonorrheal urethritis in 73.3%, no etiological factor in 14.8%, and von Lackum found that 74% of his series had a history of specific urethritis.

In our series of cases only 58.9% gave a history of one or more attacks of gonorrhea, whereas in 33% the patient stated that he did not previously have an attack of gonorrhea.

The following table contains an analysis of the cases who had a history of one or more attacks of gonorrhea, and likewise the number of patients who had no history of a previous attack of gonorrhea.

Cases with previous gonorrhea:		
With one attack	425	
Two attacks	97	
Three or more attacks	67	
	589	= 58.9%
Cases with no previous gonorrhea	330	= 33.0%
Cases without information in history	81	= 8.1%
Total	1,000 Cases	

We believe that acute epididymitis as a complication of gonorrheal urethritis is synonymous with an infection of the adnexa. Therefore, if a patient gives a history of having an attack of epididymitis during an attack of gonorrheal urethritis, it behooves us to examine the prostate and seminal vesicles for the presence of pus cells. The following table gives the number of patients in this series who had such attacks:

Left epididymitis	89 patients	= 8.9%
Right epididymitis	70 patients	= 7.0%
Bilateral epididymitis	30 patients	= 3.0%
Total	189 patients	=18.9%

Unfortunately, many patients, as well as physicians, are of the opinion that chronic prostatitis is a venereal disease and, therefore, if one suffers from chronic prostatitis the deduction is made that it is, in all probability, of gonorrheal origin. Such observations and conclusions are not borne out in our study. Furthermore, this general viewpoint is an injustice to many patients, and the promiscuous use of the term "chronic gonorrheal prostatitis" is not only unfair to the patient, but is careless medical speech. Our use of the term "chronic gonorrheal prostatitis" is limited to those cases in which a careful examination of the prostate showed gonococci.

In this series of one thousand cases, gonococci were found in the prostatic strippings of only 24 cases. The fact that only 24 cases of chronic prostatitis showed gonococci in the prostatic fluid emphasizes the statement made above that chronic gonorrheal prostatitis is a relatively rare finding.

One phase of this subject that has received very little consideration is the relationship between abscesses of the prostate and chronic prostatitis. For the purpose of discussion, attention may be called to the fact that, in some cases, the abscess is the complication of an acute gonorrheal urethritis. However, not all cases of abscesses of the prostate have this origin; for instance, one of us (H.L.K.)[2] has shown that abscess of the prostate may be due to the passage of sounds, catheters, and cystoscopes, or that it may be metastatic in origin and follow such lesions as furuncle, carbuncle, osteomyelitis, empyema, or an appendiceal abscess.

Many of the patients are relieved of their symptoms, either when the abscess ruptures spontaneously (into the urethra, rectum or bladder), or when the abscess has been opened and drained (perineal prostatotomy). The point which we wish to emphasize at this time is that in all, or nearly all, of these cases, there is an associated prostatitis.

After the abscess has been drained, or after it has ruptured, the symptoms subside. If these patients are examined carefully, it will be discovered that the prostatic fluid still contains pus, which can be demonstrated by simple examination of the prostatic strippings; hence there re-

mains a possible latent focus of infection, and the treatment should therefore be directed towards clearing up the infection. Because of our experiences just mentioned, we never discharge a patient who has been operated upon for abscess of the prostate until the strippings are free of pus cells.

When stones are present in the prostate, careful examination will usually show an associated chronic prostatitis. In cases in which there are no symptoms referable to the prostate, stones may be found in routine roentgen-ray examination. Massage, in such cases, generally shows the presence of pus cells in the expressed fluid. The relationship between stones and infection is still a matter for discussion. Some are of the opinion that the stones produce a chronic infection, whereas, others believe that stones are the result of chronic prostatitis.

The relation of urethral stricture to chronic prostatitis is usually not appreciated. Many times attention is directed toward the treatment of the stricture with little thought given to the examination or treatment of the prostate. We believe that chronic prostatitis is a concomitant finding in the large majority of patients with strictures of the urethra, especially filiform or impassable strictures, or strictures of small calibre. This association has been a relatively frequent one in our experience, and it has not been uncommon to see many patients, who have had efficient treatment for strictures, elsewhere, present themselves for various symptoms due to chronic prostatitis. These patients previously had no treatment directed to the prostate. Therefore, the statement is justified that every patient with urethral stricture should have a careful examination of the prostatic fluid.

The presence of an infection in the prostate is sometimes not recognized until after the passage of urethral instruments such as sounds, catheters, or cystoscopes. This infection, although present and dormant before instrumentation, is stirred into activity by the instrumentation and is characterized by chills and fever and often severe urinary symptoms. We believe that the clinical entity called "urinary chills and fever", that frequently follows urethral instrumentation, is a manifestation of infection in the prostate gland. On the other hand, instrumentation may be the direct cause of an infection in the prostate. This fact may or may not be recognized at the time, and, if not, the condition remains untreated for years.

Since the monumental work of Billings[3] on focal infections, the role of the prostate in the production of metastatic lesions in other parts of the body has been generally appreciated. On the other hand, the fact has not been generally recognized that the prostate may be the metastatic manifestation of disease in a remote part of the body. For example, we have seen many cases in whom infections of the prostate gland followed acute tonsillitis, sinusitis, and otitis media as well as acute respiratory infections, influenza and occasionally furunculosis.

We agree with Pelouze[4] that in many instances prostatic infection cannot be cleared up without treating other distant foci of infection as mentioned above. In the following table are given some of the lesions that were commonly met with in this series of cases:

Chronic tonsillitis	92 patients
Infected teeth	75 patients
Disturbance of colon	43 patients
Chronic sinusitis	25 patients
Total	235 = 23.5%

Bacteriology: Although the literature on chronic prostatitis is very extensive, it is interesting to note that the bacteriology has not received very much consideration and study. Some of the earliest writers to study, by cultural methods, the bacteriology of the prostatic fluid are Young, Geraghty and Stevens.[1] More recently, von Lackum[5] has devoted much study to this question and reported his cultural results in a large series of cases. Our records show that cultures were made in 407 cases. No special culture media were used; therefore, our results were, or are, at variance with the results obtained by workers who have made a special and intensive study of this problem by using special culture media. We feel that had special cultural methods been used by us in this series, the results would show somewhat different types of organisms. This statement is verified by our recent investigations in which special media have been employed. In a recent study a much larger number of streptococci have been found than in the present series. Our studies are presented in the following table.

B-coli	231 cases
Staphylococci	142 cases
Diphtheroid	12 cases
Pyocyaneus	12 cases
Streptococci	10 cases

Besides cultural methods, microscopic examination of the expressed fluid was carried out. In our technique, stained smears were made as a routine procedure. Not only are stained slides made at the time of the first examination, but this procedure is carried out from time to time during the entire course of treatment. The repeated use of this method of examination showed changes in the bacterial flora. In other words, during a long course of treatment the bacteriology changed so that organisms found at the first examination were replaced by other organisms during the course of the disease. In a few instances, smears were postitive when cultures were negative and vice versa.

In view of the fact that this method can be used so easily as a part of the office routine, we believe that stained smears should be made in every case from time to time during the course of treatment. In some instances, this method of examination has been of great value. For example, during an acute exacerbation of symptoms with an increase in the amount of pus, there is not only a return of the organisms previously absent in the smears, but they are present in much larger numbers.

We have also noticed that besides a return or increase in the number of bacteria present in the stained smear, there has been a change in the bacterial flora.

Disappearance of bacteria from the smears or a diminution in number are points of information that can be obtained easily, and, of course, may be guides that influence the prognosis and the length of time the treatment should be continued. Contrary to the notion that generally prevails, this is not a difficult thing to do and no special technique is required.

In the following table are given the results of examinations of stained prostatic strippings in 633 cases:

EXAMINATION OF STAINED FLUID

B-coli	361 cases
Staphylococci	193 cases
Gonococci	24 cases
Streptococci	12 cases
Bacilli	43 cases
Total	633 cases

Cytology: The normal prostatic fluid has a translucent, gray-white appearance, and about the viscosity of glycerine. It is homogeneous. Under the microscope, normal prostatic fluid consists of lipoid granules, epithelial cells, corpora amylacea, and spermin crystals.

In the patient who suffers from chronic prostatitis, there are marked changes in the cytology of the unstained prostatic fluid. The normal elements disappear and are replaced by pus cells and degenerated epithelial cells, as well as cells filled with large refractile dropets. As the prostatic condition improves, the pus cells gradually diminish and the normal cellular elements return.

The microscopic examination of the strippings from an infected prostate shows two interesting findings. In some instances, many clumps of pus cells are seen, whereas in others there is a uniform distribution of pus cells. It is our opinion that the examination of the fresh unstained prostatic fluid is one of the most valuable diagnostic aids in the treatment of chronic prostatitis.

For the purpose of indicating the amount of pus present in the microscopic field, we use 1+, 2+, 3+, 4+ for grading, which, while not scientifically accurate, clinically serves as an important method in tabulating the progress of the patient. Usually as the treatment is continued the amount of pus gradually diminishes, and is accordingly recorded as 3+, then 2+ and later on 1+, until the strippings are free of pus and the normal elements have reappeared.

We have seen patients in whom the strippings showed 1+ pus at the time treatment was discontinued, but following an acute attack of tonsillitis or sinusitis, the prostate again showed a 4+ pus without any localizing symptoms. On the other hand, we have seen patients in whom the strippings showed 4+ pus at the time treatment was discontinued, and who upon subsequent examination a year later showed normal prostatic fluid.

In view of the fact that an examination of the unstained prostatic fluid can be made in a few minutes, we believe that it is a very valuable adjunct in treating this group of patients. Naturally, the amount of pus found will depend upon the severity of the infection, and the duration of the disease, and whether or not the patient has had previous treatment.

In the following table is given the amount of pus according to this method of grading at the time the patient first presented himself at the office for examination and treatment:

EXAMINATION OF PROSTATIC FLUID

4+	480 patients
3+	244 patients
2+ or less	276 patients
	1,000 patients

Serology—Complement fixation test: We do not wish at this time to review the literature on the value and the limitations of the gonorrheal complement fixation test, but only to state the results of our experience with this test in this series of cases, since we feel that the number is large enough to justify certain conclusions.

In some cases of arthritis associated with chronic prostatitis the question may occasionally arise regarding the etiology of the arthritis, that is, whether or not the patient has an attack of so-called "gonorrheal rheumatism." The use of the complement fixation test may be of value in answering this question. The results of 496 examinations are at hand. In some of the patients in whom the test was positive there was no history of an antecedent gonorrheal infection and the examination was negative for gonococci, so that great care must be exercised in interpreting the results of this test.

In only 20 of which the test was positive and negative in 476, so that a positive test was obtained in about 4 per cent.

COMPLEMENT FIXATION TEST

Positive	20 patients
Negative	476 patients
Total	496 patients

Urinary Findings: It is a well recognized fact that many patients with chronic prostatitis present themsetlves for examination and consultation because of pus in the urine, which, in many cases, has been found by the family physician, the life insurance examiner, or by a clinical laboratory. In our series, the most frequent finding in the examination of the urine was pus cells. Besides pus cells, red blood cells or albumin may be found, and in a small percentage (7%) casts were present. It is also well to recognize that the patient may have a urine that is clear and sparkling and yet the microscopic examination shows the presence of pus cells. The following table gives the results of the urine analyses in our series:

URINE

Pus	797 patients
Blood	184 patients
Albumin	152 patients
Casts	77 patients

Rectal Examination: The diagnosis of chronic prostatitis is made from the rectal findings and an examination of the prostatic fluid. We believe that changes in the consistency of the prostate are of the utmost importance, and in a careful examination can readily be differentiated from the consistency of the normal gland. One of the most important findings is that of increased consistency, which, at times, may be so hard that it arouses suspicion of malignancy. Or the opposite may be present, viz: the prostate is soft and boggy. In rare instances the periphery may be hard with a soft center, due no doubt to an old abscess. Any change in the consistency should arouse suspicion for the presence of infection. Another important observation relates to the group in whom the rectal findings recorded a normal prostate, but the prostatic fluid revealed pus in varying amounts from 4+ to 1+.

In 207 of these 1000 cases, the rectal findings were recorded as showing a normal prostate. However, the examination of the prostatic strippings showed the presence of pus cells. Therefore, it is important to bear in mind that the rectal examination alone is not sufficient to establish the diagnosis of chronic prostatitis in a given case.

We also wish to call attention to the fact that there is a borderline group of cases in which the rectal findings and prostatic fluid are normal on first examination, and upon repeated examinations pus cells are found in the strippings. The rectal findings are reported in the following table:

RECTAL FINDINGS

Normal	207 patients
Hard and irregular	465 patients
Increased size	440 patients
Periprostatitis	289 patients
Boggy	180 patients

Pathology: The gross anatomical changes are characterized chiefly by an increase in the consistency of the prostate. The surface may be smooth, but in other instances it may show more or less irregular elevations which are firm and hard. The capsule is generally adherent and can only be removed with great difficulty.

On section, the tissue is gray-white with varying amounts of fibrous connective tissue which may make up three-fourths of the gland. In surfaces made by cutting, a turbid fluid escapes and such surfaces are irregular. Here and there, one may see small cystic areas that vary in size

up to a split pea and are filled with either a gray, yellow cheesy material, or a dark watery fluid.

The micropathology may be discussed under two headings. First, diffuse inflammatory changes in the gland; and second, multiple localized regions of polymorphonuclear or round cell infiltration. In a microscopic study of many sections of prostatic tissue obtained from autopsy material, we were not able to observe an instance in which the infection was limited entirely to either the glandular structure or interstitial tissue. (Figures 1 and 2). In other words, we feel that a differentiation between parenchymatous and interstitial prostatitis is exceptionally difficult to make. A majority of the microscopic sections showed the acini to be filled with a poorly stained material made up chiefly of desquamated cells enmeshed in a homogeneous mass that stained a pale pink. Regions of inflammatory reaction appeared around the base of the glandular structure which in many cases extended into the acini. These regions are characterized by an increase of the polymorphonuclear cells, lymphocytes, and plasma cells and show a marked variation in the proportion of one to the other. In other sections, there was a marked increase in the interstitial tissue characterized by a proliferation of fibrous tissue and infiltration of lympocytes and polymorphonuclear cells. In the second type, the chief micro-

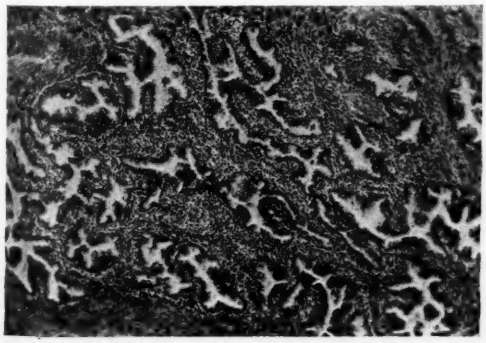

Fig. 1. Showing extensive round cell infiltration with connective tissue proliferation.

pathological changes appeared to be localized and circumscribed areas of round cells or polymorphonuclear cells which would fill the view of a high power field. (Fig. 3). These circumscribed regions were distributed throughout the section, and, in some instances located near the base of the acini. The center of these regions, many times, was found to be broken down and filled with partly destroyed cells. At other times, a few small abscesses were observed.

Associated Pathology: In this series 395 patients were examined with the cystoscope and of

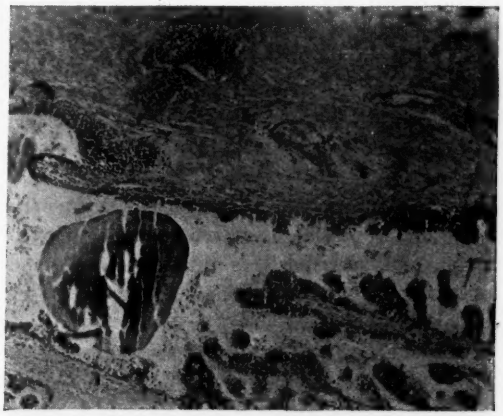

Fig. 2. Showing some of the acini filled with granular detritus and round cell increase in the interstitial tissue and many large starch bodies.

this number 61% showed changes around the bladder neck and prostatic urethra, and 39% were normal.

The important observations as seen through the cystoscope are as follows: The bladder neck is usually irregular and the mucous membrane fluffy and granular. Frequently small translucent cysts, similar to cystitis-cystica, can be seen. Many times a trigonitis is present. At times, quite the opposite picture is observed, in that the bladder neck is shiny, white and pale. In such cases it is frequently difficult to differentiate between a true fibrosis of the bladder neck and the secondary change from an infected prostate.

The most important changes in the urethra from chronic inflammation of the prostate gland are in the region of the verumontanum. These pathologic changes are chiefly characterized by edema, redness, and in some instances localized hemorrhagic areas. Flakes of pus may be seen with the urethroscope. In another group, the verumontanum may be small and atrophic, the tissue gray and pale from fibrosis. Frequently such a picture follows the promiscuous use of topical applications of various medicine, such as silver nitrate, etc. We have never felt justified in treating such inflammatory lesions in the

posterior urethra by topical applications of any kind.

In our opinion infections of the seminal vesicles occur in practically all cases of chronic prostatitis. Many urologists share this point of view. The seminal vesicles may be soft and atrophic, or enlarged, thickened and hard.

The occurrence of epididymitis has been discussed previously in this paper.

It is surprising to note the frequency with which changes in the lower ureter occur in cases of chronic prostatitis as demonstrated by means of intravenous urography. These gross pathologic alterations are characterized by dilatation and atony which, in some cases, may involve the whole ureter, but more frequently the lower part. As a result peristalsis is interfered with and ascending kidney infections may occur. This

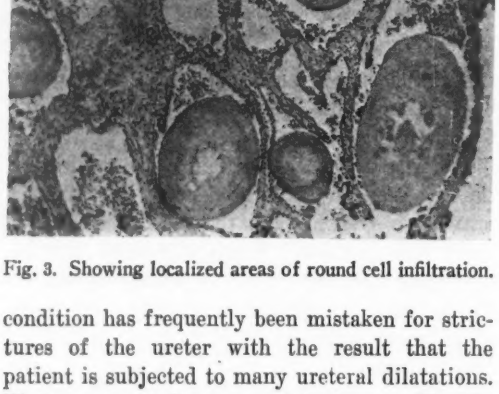

Fig. 3. Showing localized areas of round cell infiltration.

condition has frequently been mistaken for strictures of the ureter with the result that the patient is subjected to many ureteral dilatations. We have repeatedly seen such instances. Usually the dilatation and atony of the ureter subside after the prostato-vesiculitis is cleared up.

Dilatation of the pelvis with clubbing of the calyces and mild urinary stasis has been demonstrated, in this series, often unexpectedly by means of excretory urography in patients with chronic prostatitis. Our experiences are in accord with those of von Lichtenberg.

SYMPTOMS

The one striking impression from this study is that symptoms of chronic prostatitis are not at all characteristic; many times the symptomatology is so diversified that an infected prostate is not suspected. On the other hand, in a certain number of cases, a carefully obtained history will at once direct attention toward an investigation of the prostate. Because the symptoms in this series were so varied, we have classified them under the following headings.

Urinary symptoms: The relationship of the prostate gland to the neck of the bladder is such that one would expect an infection in the prostate to produce urinary symptoms. If this fact is borne in mind, fewer would be the diagnoses of cystitis. Patients who have relapsing attacks of cystitis often suffer from prostatitis, and the treatment should, therefore, be directed not to the bladder but to the prostate.

Again we wish to emphasize the fact that the presence of an urethral discharge does not mean gonorrhea, and in order to make the proper diagnosis it is necessary to examine the discharge microscopically. The gross appearance and character of the discharge is variable. It may be profuse, or so scant that urethral stripping is necessary to obtain it, or it may be present only in the morning, the so-called "morning drop." The discharge may be thin, sticky and watery, very similar to glycerin, or thick and creamy and present only during the day. The symptoms are given in the following table:

Urethral discharge	389 patients
Frequency	346 patients
Burning	307 patients
Nocturia	289 patients
Urgency	149 patients
Hesitation	148 patients
Stinging	121 patients
Pyuria	105 patients
Dribbling	102 patients
Hematuria	86 patients
Straining	80 patients
Prickling	65 patients

Sexual symptoms: It is very important to bear in mind that chronic prostatitis plays a very important role in the production of sexual symptoms, a fact that is not often recognized. It should also be noted that much marital difficulty, so-called "incompatibility," is due to chronic prostatitis, and many of these cases ultimately end in the divorce courts. Therefore, we, as physicians, can often prevent such a situation from occurring by the recognition of the underlying cause. The importance of obtaining an accurate history in these cases is self-evident. Many times it is difficult to differentiate between impotence from chronic prostatitis, and so-called psychic impotence.

The one outstanding symptom in this series

was the presence of premature ejaculations found in practically 20% of the cases (19.7%) and it is probably the one symptom that causes the patient the greatest concern.

The various sexual symptoms follow in the table:

Premature ejaculations	197 patients
Loss of desire	157 patients
Weak erections	139 patients
Loss of erection	77 patients
Nocturnal erections	54 patients
Painful ejaculations	42 patients
Hemospermia	36 patients
Painful sexual intercourse	25 patients
Sterility	18 patients
Prostatorrhea	15 patients

Metastatic symptoms: This group of symptoms is interesting for the reason that frequently the prostate is not suspected nor investigated as a source of infection. In our series the most common metastatic lesions were arthritis, neuritis, and iritis. The following table reveals the number of patients who had such symptoms.

Arthritis	286 patients
Neuritis	150 patients
Iritis	24 patients

It is our impression that one of the most common causes of lumbar-ache in middle aged men is chronic prostatitis. Frequently patients present themselves with metastatic symptoms that have extended over many years and in whom a careful search has been previously made for foci of infection with the exception of the prostate gland. The teeth and tonsils have been removed; sinuses drained without any improvement in the symptoms. The prostate gland is then examined and if infected and the infection cleared up is followed by the disappearance of the painful joints, sciatica, or neuritis.

One of the spectacular types of patients in this group are those with acute iritis in whom an infected prostate was found as the cause of the condition.

Although we do not believe that in every case there is a connection between the metastatic symptoms and an infected prostate, or between infected prostate and other foci, yet we have always strongly advocated the removal of any suspicious foci in those patients who have metastatic symptoms.

Nervous symptoms: It has not been so many years since the diagnosis of sexual neurasthenia was a very common one, but in more recent years this term has practically disappeared from the literature.

The analysis of the patient presenting a long list of nervous symptoms, combined with sexual disturbances deserves a great deal of thought and care, in order to fathom out cause and effect. There are times in which the patient's symptoms are caused from fear. Fear that an old attack of gonorrhea may return, or that it has not been entirely cured and that he may transmit the infection to his wife or partner. This condition has led to a psychic impotence in some cases and in others a great psychic depression.

From this series, we have observed patients, who because of their disturbed sexual symptoms caused from a chronic prostatitis which had gone unrecognized, had developed a severe melancholy or depression which in one case led to suicide.

The silent prostate: Although we realize that the use of the term "silent prostate" may be open to criticism, still we feel that its use is justified to designate a certain group of cases for want of a better, or more descriptive term. By this term, we mean a group of patients with general symptoms, the causes of which are not apparent, and in whom upon further study the symptoms have been found to be caused by chronic prostatitis, and yet, as far as the prostate is concerned, there are no local symptoms. This group is extremely interesting from the standpoint of differential diagnosis because a majority go on for many years without being recognized.

TREATMENT

The literature concerning the treatment of chronic prostatitis is interesting from the standpoint of the many methods advocated for the treatment of this disease. It is our opinion that the two most important elements in the treatment of chronic prostatitis are the application of heat to the prostate and the systematic use of prostatic massage.

In every case in this series of 1,000 cases some form of heat—either in the form of hot sitz baths twice a day, or the use of hot rectal irrigations, or the use of hot water through a prostatic psychrophore, or the use of heat applied through the rectum to the prostate by the means of the Bransford Lewis electric heater, was recommended. Each and every patient was advised to use heat, and the importance of heat was explained to the patient so as to encourage its daily use. Equally as important as the use of heat per rectum is the employment of prostatic

massage. In order to be effective this should be carried out at stated intervals. As a rule, massage is carried out twice a week and, as the patient's condition improves, the number of treatments are reduced so that the patient receives massage once a week; and a little further on massage is carried out about once every ten days. In other words, as the patient's condition improves the number of treatments is reduced. We have never been impressed by the necessity nor the advantage of daily prostatic massage. In some of the patients a period of rest was recommended; that is, after treatment had been carried out for three or four months, the patients were instructed to omit the prostatic massage. In some of the patients upon their return in two or three months we were agreeably surprised to find that the prostatic strippings were free from pus.

It is not necessary to call attention to the fact that the objectives to be attained by massage are to empty the prostate of its purulent contents, to stimulate absorption, and to increase the blood supply to the prostate. Naturally, massage must be without pain. It is needless to state that the massage should be firm enough to express the infected secretion. It should never be followed by or associated with discharge of blood at the external urethral orifice, nor should it produce pain.

Cases with turbid urines are treated either by irrigations with potassium permanganate or silver nitrate, or instillations of protargol or argyrol into the bladder and urethra. However, when the patient's urine is clear we do not irrigate and we do not give him deep urethral injections. Massage is followed by anterior urethral injections, the patient lying flat on his back on the table. The fluid is held in the urethra with a penis clamp. In a certain number of instances the fluid will trickle back into the deep urethra. Since we have discontinued routine irrigations as well as deep instillations, the incidence of epididymitis as a complication during the course of treatment of chronic prostatitis has practically disappeared.

It is needless to say that patients with stricture of the urethra need appropriate treatment.

It is a well known fact that chronic prostatitis is slow to respond to treatment and that it is necessary, therefore, to have the patients under treatment for long periods of time. It is because of this fact that many patients are not cured—they discontinue the treatment and also at times the physician loses interest in the patient. We feel that the best results are obtained in the cases in which the patient cooperates by carefully adhering to directions and in which the physician enthusiastically carries out the local treatment.

Highly seasoned foods, condiments and alcoholic beverages should be avoided. We doubt very much whether the occasional use of alcohol in small amounts, or the occasional use of condiments during the course of chronic prostatitis is harmful to the patients.

Constipation and gastrointestinal upsets have a direct bearing on infection of the prostate. Therefore, the gastrointestinal tract deserves careful management.

A very important contribution to the treatment of chronic prostatitis has been the advocation of the removal of foci of infection. We agree with this thought. Teeth, tonsils and sinuses, if suspicious for foci of infection, should be treated or removed.

Vaccines, serums, injections of foreign proteins and intravenous injections have never given us very much aid. Recently Grant has again revived interest in intra-prostatic injections.

In none of these 1,000 cases was surgical intervention directed toward the prostate employed. We feel that prostatectomy in cases of chronic prostatitis is not indicated and likewise prostatotomy is rarely justified except in that rare type of case discussed by Dr. David M. Davis.[6]

The patients in our series had only one type of treatment as far as the prostate is concerned, viz: massage and heat which is applied either in the form of an electrical or hot water prostatic heater. In the following table are given the duration of treatment and the results in this series:

One month	85 cases
Two months	172 cases
Three months	171 cases
Six months	234 cases
One year	148 cases
Two years	90 cases
Three years	56 cases
Four years	30 cases
Five years or over	14 cases

RESULTS

Cured	412 cases
Improved	398 cases
No change	180 cases
Not stated	10 cases

SUMMARY AND CONCLUSIONS

1. In 33% of the patients in this series there was no history of a previous gonorrheal infection.

2. In only 4% was a positive complement fixation test obtained.

3. Foci of infection, such as tonsils, teeth, sinuses, gastrointestinal tract and upper respiratory tract, may be causative factors in the producion of chronic prostatitis.

4. Infections of the prostate can be the cause of arthritis, neuritis, myositis, iritis, psychasthenia and other nervous manifestations.

5. The value of using a standard for determining the amount of pus present in the strippings and its value in showing the progress made by treatment is given.

6. The importance and value of repeated microscopic examinations of the prostatic fluid is emphasized.

7. Attention is called to the frequency with which the rectal examination with the examining finger is negative.

8. Attention is directed to the fact that chronic prostatitis may run a silent course and also to the fact that its manifestations are variable.

9. Contrary to the general opinion that exists in the minds of patients and physicians, this is not an incurable disease.

10. Our experience based on this series of cases emphasizes the fact that the treatment must be carried out over a long period of time and, furthermore, that the most efficacious agents are heat, massage and the removal of suspicious foci of infection.

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INFECTIOUS MONONUCLEOSIS

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Infectious mononucleosis is a disease characterized by fever, enlarged and swollen cervical lymph glands, peculiar posture of the head, abdominal pain and an increase in the number of mononuclear cells of the blood. It was first described in 1886 by Filatow of Moscow, and later by Pheiffer in 1889, when for a long period it was called by that name. It usually occurs in the Spring and Winter months, attacks both sexes, and is much more prevalent in individuals between the ages of 5 and 15, and comparatively rare in children below the age of 5. The etiology is still questionable, though a filtrable virus is supposedly the cause. The disease is contagious, infection occurring usually through the respiratory tract.

The incubation period is usually between 5 and 10 days, and the onset is usually sudden. The symptoms then simulate very closely that of an influenza, tonsillitis or pharyngitis. The patient complains of headache, malaise, cough, sore throat, aching of the bones and fever. At times there may be obstipation, vomiting and even diarrhea. The fever may reach 105, and associated with a very rapid pulse and slight prostration. Usually, enlargement of the cervical lymph glands occurs early, and within 48 hours the patient complains of swelling and tenderness of these glands. They are usually posterior to the sternocleidomastoid muscle and occur in chains. Due to the tenderness of these glands the patient usually holds his head as that of a rheumatic torticollis. One can easily see that, due to the position of the head with voluntary rigidity of the neck, one could easily confuse the disease with meningitis. Usually the cervical lymph glands begin first on the left side, and in a few days become bilateral. These glands in a few days may involve the bronchial, retroesophageal, mesenteric, axillary and inguinal regions. The temperature range is usually quite high, as-

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sociated with morning remissions, for 3 to 21 days. As the temperature recedes, the glands eventually disappear. The spleen and liver may be palpable. In a few cases jaundice and maculopapular skin rash were present.

In 40% of cases, the mesenteric lymph glands are involved with their characteristic abdominal pain, nausea, vomiting, temperature, leucocytosis and local findings of rigidity. In these cases a diagnosis of an acute abdomenal lesion is usually made, such as an acute appendicitis, with immediate surgical intervention. When the bronchial glands are involved, the patient usually presents the symptoms of a croupy cough—at times to be misdiagnosed as post-pertussis, tuberculous tracheobronchial pathology, etc. In retroesophageal glandular involvement, dysphagia is usually quite pronounced.

The blood shows an absolute and relative increase in the non-granular mononuclear cells. The white blood count varies between 15,000 and 30,000. Of the total number of cells, 80% to 90% are of the non-granular type, and, according to Longcope, are in the following forms: 1. Small mononuclear leucocyte, identical with the small lymphocytes; 2. Large mononuclear cells identical with the large mononuclears, and 3. Atypical mononuclear cells.

When the entire picture is elicited with its characteristic symptoms, plus high temperature, diffuse glands, palpable spleen, leucocytosis, with a so-called lymphocytic response of 90%, it is no wonder that it is easily confused with acute leucemia, and many a clinician is surprised to find that his so-called case of acute leucemia gets well. One knows very well that the prognosis of infectious mononucleosis is good, and that for an occasional complication of nephritis, otitis media, or suppuration of the gland, no deaths have been reported.

Thus, one can easily see that the disease is of interest to the otolaryngoligist, dermatologist, surgeon and internist; for the differential diagnosis includes such conditions as tonsillitis, pharyngitis, influenza, rheumatic torticollis, meningitis, tuberculosis of the lymph glands, lues, hodgkins, acute abdominal conditions such as acute appendicitis, skin rashes, mediastinal tumors, cases of jaundice and lastly, and most important, acute lymphatic leucemia. It is the early usage of the heterophilic agglutination test that absolutely and specifically clinches the diagnosis of infectious mononucleosis.

It is interesting to note the developmental steps in the specific usage of the heterophilic agglutination test in infectious mononucleosis. Forssman observed that emulsions of the tissues, other than blood cells, of the guinea pig, cat and horse stimulate the production of lysins for sheep red blood cells, just as sheep red blood cells themselves do when injected into rabbits, and that these substances contain the heterophil antigen. The heterophil antigens or antibodies are distinct from specific baterial agglutinins and precipitins; this is demonstrated by the absorption tests. The above is the Forssman phenomena. Davidsohn[1] showed in 1929 that, following the injection of horse serum, which is a known carrier of heterophil antigen, an increased titer of heterophil antibodies occurred in the blood of patients suffering from horse serum disease.

Paul and Bunnell[2] in 1932 found that the sera from cases of infectious mononucleosis agglutinate sheep cells in a titer of 1-64 or higher, while the sera from normal patients or those suffering with other pathological conditions agglutinate sheep cells to a lower titer of 1 to 8. They also found that patients who received horse serum had a high titer of 1-64 or higher. They observed the presence of the heterophil agglutinins in four cases of infectious mononucleosis. As a control they recorded 2,000 tests, which were done on patients who entered the hospital. Among these cases were those of blood dyscrazias, such as purpuras, pernicious anemia, leucemia, aplastic anemia, polycythemia, heart, gastrointestinal, and infectious diseases. In none of these cases was the titer higher than 1-8 and in most cases there was no response at all. A positive test shows a titer of 1-64 or higher.

Bernstein[3] reported 5 cases of infecious mononucleosis in 1934, in which 4 showed a definite positive heterophilic agglutination test. One test was positive a few days before the blood showed its characteristics of the disease. This case showed the presence of the antibodies, before the appearance of the monocytes in the blood. The

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titer here was 1-256, which remained high for 10 days. It took 3½ months before a normal level was reached. The 5th case that he reported of a child of 6 gave a negative result in the presence of a definite infectious mononucleosis.

Bunnell[4] in 1933 reported 15 cases of infectious mononucleosis, in which the heterophilic agglutination test was positive in 13 cases. The titer was 1-64 or higher.

Rosenthal and Wenkebach[5] recounted the histories of 10 patients in whom the only detail whereby their illnesses could be differentiated from infectious mononucleosis was the normal concentration of heterophile agglutinins in their blood sera. They felt that those cases that had a positive test were classified as infectious mononucleosis and those that were negative were classified as glandular fever. They also report that a positive Wassermann occasionally occurs in infectious mononucleosis. Turk in 1907 reported a case which he confused with acute leucemia.

The heterophilic agglutination may remain positive from 6 weeks to 9 months, and even longer, before normal values are reached. The incubation period for a positive test is usually about 6 days; the same is true for a positive reaction in serum sickness. The lowest titer in infectious mononucleosis which may be considered as positive is 1-64, while the highest titer may reach 1-4096. Usually the height of the agglutinin response is fairly well correlated with the severity of the disease; while the development of the heterophil agglutinins for sheep cells run parallel to the formation of the pathological lymphocytes. As one gets a decrease in the agglutinin titer, there is a corresponding decrease in the number of monocytes. It is interesting to note that an absolute lymphocytosis of normal lymphocytes may persist for months. Those cases, which are not due to infectious mononucleosis or serum sickness, may give a positive agglutination of a titer of 1-8; this, however, has no significance whatsoever. In many cases the agglutinins were maximal in the first serum tested, while the peak of the pathological lymphocytes did not occur for several days.

According to the viewpoints of Van Ravenswassy[6] as to the significance of the heterophilic reaction; there are two explanations for the presence of sheep cell agglutinins in the sera of patients with infectious mononucleosis. The first being that the etiological agent of the disease, bacterial or virus, serves as a heterogenic antigen in their production. He cites, as an example of the above, the fact that Shiga dysentery bacilli contain the Forssman's antigen; and also that the heterophilic antibodies produced by organisms of the genus pasteurella agglutinate avian erythrocytes. The other explanation, expounded by Meyer, is that the agglutinins are normally present, but are markedly increased in infectious mononucleosis. He also compares this response to a similar reaction where he noted an increased serological response in the sera of pregnant women with Y dysentery bacilli in a high titer.

On the other hand Bailey and Raffel[7] have studied the sheep cell agglutination in infectious mononucleosis and have come to the conclusion that it is a specific test in that disease. They, however, believe that a heterophil or Forssman antibody phenomena is not responsible for the reaction, and that the antibodies are not found in normal serum, but are rather a specific response occurring only in infectious mononucleosis.

Davidsohn[8] states that by means of the absorption test, one can easily differentiate serum sickness from infectious mononucleosis.

REPORT OF CASES

Case 1. G. L., female, nurse, aged 23 years, was admitted to the medical service of Dr. M. Lewison at the Mt. Sinai Hospital, on November 19, 1934, complaining for the past week of pain along the angle of the left jaw, which was followed in a few days by a chain of enlarged glands along the posterior border of the left sternocleido mastoid muscle. This was followed in a day or two by enlargement of the glands on the right side of the neck. For the last 4 days she complained of generalized abdominal pain, persistent in character, much more pronounced in the right lower quadrant. She also stated that she felt "Grippy." With

4. Bunnell, W. W.: A Diagnostic Test for Infectious Mononucleosis, Am. J. M. Sc., 186: 346, 1933.

5. Rosenthal and Wenkebach: Die Bedeutung der Heterophilen Antikörperreaktion für die Diagnose der Infektiösen Mononucleose, Klin. Wchnschr., 12: 499, 1933.

6. Van Ravenswassy, A. C.: The Heterophile Agglutination Test in the Diagnosis of Infectious Mononucleosis. N. E. J. of M., 211: 1001-1004, 1934.

7. Bailey, G. H., and Raffel, S.: Hemolytic Antibodies for Sheep and Ox Erythrocytes in Infectious Mononucleosis: J. Clin. Investigation, 14: 228-244, 1935.

8. Davidsohn, I: Personal interview—Mt. Sinai Hospital, Chicago.

the above history of abdominal pain, she was admitted to the service as a suspect case of acute appendicitis.

On admission her temperature was 100.6 R, pulse 105, and respiration 22. Her essential findings were a bilateral chain of small, tender palpable glands along the posterior borders of both sternocleido maistoid muscles together with axillary and inguinal adenopathy. The spleen was definitely palpable. Some slight tenderness throughout the abdomen was preseint. At that time a diagnosis of infectious mononucleosis was made by the author before the blood count or heterophilic agglutination was done. She ran a 99.6 temperature for 5 days. On the same day of admission her W.B.C. was 14,150; Hb 86; R.B.C. 3,970,000; urine and Wassermann negative. The differential test showed the following:

Date	W. B. C.	Band forms	Segmented Neutrophils	S. L.	Abnormal L.	Monocytes
11-19-34 (date of admission)	14,150	2.5	24.	57.5	11	5
11-20-34	10,100	3.5	29.	45.5	16.5	5.5
11-26-34	11,900	..	52.	29	7	12

The heterophilic agglutination test taken (11-20-34) the next day after admission, showed a positive titer of 1-640. This was repeated 8 days later (11-28-34) after the patient had made an uneventful recovery, with a titer again of 1-640. The test remained positive for a few months.

Case 2. M. S., male, aged 19 years, entered the medical service of Dr. Richard Gordon on Sept. 28, 1933, complaining of diffuse abdominal pain for 5 days. The patient stated that for the last 5 days he felt sick; followed by generalized abdominal pain, especially in both lower quadrants. He had a feeling of fulness and distention after eating, associated with a good deal of belching. At no time did he vomit. He also noticed some pain in the right axilla, to be followed in two days by a glandular swelling.

He was admitted to the hospital with a temperature of 101. His essential findings were a red pharynx; few palpable glands (small) along the borders of both sternocleidomastoid muscles; a walnut size, tender gland in the right axilla; a few small glands in the left axilla; palpable bilateral inguinal glands. The liver was one finger breadth below the costal arch and the spleen was very definitely palpable. B P was 124/72. Urine, negative. Hb 75; W. B. C. 13,750; R. B. C. 4,930,000. Blood platelets 230,000. Bleeding time 2½ minutes; coagulation time 3 minutes; Wassermann, negative. Fragility test—beginning .46 and complete .32. The differential showed:

Date	Neutrophiles	S. L.	L. L.	Monocytes	Undifferentiated cells
9-29-33	14	56	6	6	18
9-30-33	21	55	6	3	10

The tentative dignosis was acute lymphatic leucemia, colitis or appendicitis. He was sent to the operating room (9-29-33) for a biopsy of the gland, with a diagnosis of acute lymphatic leucemia. The right axillary gland was removed—and showed a hyperplasia of the reticular endothelium. On the 30th of the month the heterophilic agglutination test came back showing a titer of 1-2560. The patient made an uneventful recovery.

Case 3. E. H., female, single, aged 18 years, entered the medical service of Dr. I. A. Rabens on July 20, 1934, complaining of epigastric pain for 5 days, headaches 10 days and vomiting for 2 days. On July 10, 1934, she developed a severe headache; complained of dizziness; on the 13th she had some vague pain in her right leg which subsided the next day, to be followed by cramp-like diffuse abdominal pain which localized in the epigastrium. Her temperature then jumped from 100 to 103. The onset was sudden, associated with severe headaches, malaise, high temperature, abdominal distress and vomiting. Her pulse was rapid, temperature persisted for over 2 weeks, varying between 101-103. Her essential findings were enlarged tender cervical glands on the left side, which came on one week after the onset and which gradually lessened in size. The spleen was definitely palpable. B P 95/60; urine showed a 3+ albumin. A tentative diagnosis of tuberculous adenitis, mesenteric cyst with hemorrhage, diverticulitis of the colon or a pedunculated cyst of the ovary was made. The patient was worked up from a viewpoint as to the causes of prolonged temperature. Thus the following work was done which revealed no positive information. Von-Pirquet—negative; Montoux 1-10000 negative; x-ray chest—negative; agglutination tests for typhoid, paratyphoid A and B negative; also for Shiga, Flexner, Hiss and Brucella abortus—negative. These tests were repeated twice. Stool—negative. Coagulation time 2½ minutes; bleeding time 5 minutes. Blood culture after 10 days—negative. The blood showed the following: Hb 82; W. B. C. 12,600; R. B. C. 3,700,000; blood platelets 170,000. The differential showed as follows:

Date	Hb.	R. B. C.	W. B. C.	Segmented Neutrophiles	Lymphoblasts	S. L.	L.L.	Monocytes	Remarks
7-26-34	82	3,700,000	12,600	7	8	80	1.5	3	Granulocytes 14 Non-Granulocytes 86
7-28-34	84	3,800,000	12,400	10	6	78	2	2	Eosinophils 2
7-30-34	82	3,550,000	15,400	11	6	72.5	3	5	Eosinophils 2.5
8- 3-34	..	.....	15,400	8	1	79	8	2.5	Eosinophils 1
8- 6-34	..	.....	11,600	20	1	74	2	3	

On July 27 the heterophilic agglutination test came back positive in a titer of 1-640. The patient ran a high temperature for over 2 weeks, and made an uneventful recovery.

CONCLUSION

1. The heterophilic agglutination test is a specific test for infectious mononucleosis.

2. Serum sickness gives a positive response, but can be differentiated from the above by the absorption test (Davidsohn).

3. The clinical aspects of the disease have been discussed.

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DISCUSSION

Dr. W. H. Newcomb: Dr. Isaacs has presented the symptomology, has shown the necessity of accurate diagnosis and has shown likewise the test for differentiation of this disease.

Infectious mononucleosis is an old disease that recently has been given a new name. Formerly, it was called glandular fever. The demonstration of the marked increase of mononuclear cells in this disease has lead to the use of term infectious mononucleosis. Slight interest was shown in this condition until Paul and Bunnell discovered that the serum of patients with this disease agglutinated sheep cells in high dilution. The differentiation of leucemia, of tuberculosis, of Hodgkins' disease and others from this disease is important as had been brought out by Dr. Isaacs.

It has only been since 1929 that there has been a test available for differentiation of this disease, making possible an accurate diagnosis. The test was run onto rather accidentally and was at first thought not to have necessarily any significance until it was shown that in infectious mononucleosis the agglutination would be positive with dilutions as low as one in 64 and up to 5,120, in some cases.

Likewise, it has been shown to be positive in cases of serum sickness. However, the dilution in serum sickness is much lower than in infectious mononucleosis. I understand it rarely runs over one in 64 in serum sickness, while it starts at one in 64 and goes up to 5,120 or more, in infectious mononucleosis.

This test alone possibly suggests something in reference to its etiology. One might conclude, inasmuch as there is a positive reaction in serum sickness, that this is likewise an allergic reaction rather than a specific disease. As you know, there is question whether infectious mononucleosis is a specific disease or whether it is an abnormal reaction on the part of the lymphathic tissue, although evidence would point to the fact that it is an infectious disease entity.

The test itself has been used in various ways by different workers. All have used the same amount of serum, the same amount of sheep cells. There has been a difference in the period of incubation. I think originally some of the workers used two hour incubation for this test, while others have used four hours, and it would appear that it has been standardized at four hours, and has usually been left over night in the ice-box and then incubated the following morning, whichever was more convenient.

The other point about infectious mononucleosis is the fact that most of these cases which have been reported have been more or less sporadic while, of course, epidemics have occurred. I could not find in the literature that I had available where tests were made on large enough numbers in the epidemics reported. The heterophilic agglutination test should be tried out during epidemics if that has not been done.

When the heterophilic agglutination test was brought out I remember seeing one case of multiple adenopathy that was thought to have tuberculosis. This case showed an increase in the number of monocytes, the patient was x-rayed and intradermally tuberculin tests were made, both negative. A diagnosis of infectious mononucleosis was made; the patient is now in good health.

Another case where the abdomen had been opened for appendicitis the retroperitoneal lymph glands were found to be enlarged. The patient had enlarged anterior, post cervical, and inguinal lymph nodes with a slightly red throat, pain in abdomen with rigidity. The blood count was characteristic of infectious mononucleosis and had the heterophilic agglutination test been used, operation would have been unnecessary.

I think it is important that accurate diagnosis be made in these cases, and I wish to thank Dr. Isaacs for bringing this subject before the section, because I think it is important that everybody know about it.

WOMEN AS SLAVES TO INDUSTRY

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The evolution of man, from the early cave type to the present peak of civilization, has held the attention of our scholars all through the years. One rather modern aspect of that evolution, that part which has enabled women to displace man, has apparently escaped their attention.

Any economic change in human progress, regardless of cause, has played an important role in any close study of man's development. A more recent popular pastime has been the investigation and discussion of those economic principles which brought about our present economic upheaval.

One causative factor after another has received its full share of criticism then only to be discarded. As far as the writer has been able to determine there is one gross discrepancy in our modern life which has escaped discussion. That discrepancy has been recognized by many as a major factor in the cause and a no less contributing element in the prolongation of the depression.

Myriads of remedial measures have been offered to correct the situation, but thus far only temporary stimulus and comfort have been the result. The largest single phase of human achievement which calls for the expenditure of money has to do with the establishment and maintenance of the home.

It is my purpose to discuss briefly one aspect

of modern life which reaches the confines of every home, in varying degrees and influences the lives, for better or for worse, of millions of our people. More often than not this aspect detracts greatly from the total of human happiness.

The emancipation of woman has held the attention of people for generations. Woman in industry, in professional and business life, has reached great proportions in recent years—and has thus developed unlimited potentialities along those lines. I am of the opinion that if this development is not curtailed it threatens to affect adversely the future destiny of this particular nation.

Our United States of America with their one hundred and twenty-five millions of people and the colossal melting pot of races and creeds is so vast that it cannot materially be affected except by those things which reach down to the fundamentals of the home. There is no one paramount disturbing factor, but this is one that affects, more or less severely, millions of our homes and thus cannot intelligently be ignored.

Thanks to our more thoughtful statesmen during the more recent years our melting pot is no longer heaped with scrambling humanity. The amalgamation of our foreigners is offering now opportunities for their American born descendants to assimilate both our ideas and our ideals.

The past one hundred years have revealed very startling changes in our mode of living. They have given us pleasures and opportunities never dreamed of by our ancestors. Many things that are commonplace today would have startled our people of even an half century ago. Many of these advances are so evident that one rarely questions them. They have become part of modern life. That all of these have been or will prove to be blessings can be seriously questioned. Women in industry and professional life is one type of advancement that should be seriously considered.

Great men and women through the ages have stood on the principle that the basic foundation of good government rests upon the substantial homes within a country. Homes where character and responsibilities of life are taught to be the most essential and the baser attributes frowned upon; where any influence which might detract from such homes would be received with suspicion and alarm.

Previous to the World War the American home represented a cross section of the home life of nearly all nations. All too often since then the less desirable element of home life from the many nations has been landing on our shores; and not the higher strata of foreign family folk. Millions of those wives and mothers both real and prospective were forced into American industry at a payment wage quite incompatible with our native standard of living. This is what was withdrawing from those new homes all that remained for the development of character, honesty, and a love for their adopted country.

The dominant influence in every home has always been the mother—a fact too often ignored in our national life for several generations. The industrial revolution that has swept this country during that period and the emancipation of women through business and professional life, have taken out of and away from our homes millions of women. A few of them have succeeded in their chosen field, but they could, for the most part, have given the world a far more valuable contribution through the capacity of wife and mother.

It has been well said that statistics may be used to prove anything desired by the statistician. However a study of the figures relative to women gainfully employed makes evident some very pertinent facts. A review of the statistics relative to employment, unemployment, the emancipation of women from her slavery to man, to where she now sits as his equal or superior, reveals some very suggestive and instructive details. Millions in industry, thousands in the professions and hundreds in politics, each one displacing a man, thus depriving him of the opportunity of earning a living for himself and family.

In 1930 there were more than ten million women between the ages of fifteen and sixty-four who were gainfully employed. This number is an increase of about one and a half million from the preceding ten year period. If by any measure of values one can conceive of how 25% of the female population can be gainfully employed and for the most part away from home life, without thus undermining the foundations of our American homes, it must be based upon a new method of reckoning.

About 50% of those women employed or about five million are either single or have not reported the marital state. Eight per cent. of the total female population or about two million seven hundred thousand of the housewives are gainfully employed. The least important group of women working for a wage are those widowed and divorced and are represented by about two million three hundred thousand, or in excess of six per cent. of all women between the ages of fifteen and sixty-four.

No figures are available to show how many divorces have resulted from the employment situation, either because the husband fails to find a place for himself or where the wife becomes weary of supporting a household and desires further freedom and independence.

Reports do show that there has been a steady increase in divorces in all civilized countries except Japan, the United States maintaining the highest rate. In 1886 there were over twenty-five thousand divorces in this country. In 1916 one hundred and twelve thousand, an increase nearly four times as rapid as the increase in population. In 1929 there was one divorce in every 6.1 marriages. More than one hundred thousand children are affected by divorce each year.

Society has frowned upon conditions that are considered as slavery for women in the homes, but the millions of women slaves to American industry have apparently escaped notice.

With an excess of five million women working out a mere existence in our factories, how can we justify that proud claim of being the most prosperous of all nations with a standard of living above all others?

With appproximately another five million women engaged in professional work, politics and administrative positions may we not assume that woman's emancipation may lead to the defeat of its own purpose. A survey of the future, in the light of the present and the immediate past should enable us to develop plans for the removal of millions of American women now imprisoned by industry. Place them and the coming generations in homes where natural mother instincts may hold sway.

The problem of economic adjustment has affected more or less severely every man, woman and child in this country. Every organization of whatever type has been forced to reconstruct its program and curtail many of its activities. Those restricted programs and limited influences, especially those of educational institutions, will affect adversely the present generation of our youth. Again the need for the best homes with mothers to supplement the work so long carried by our institutions.

A century or less in the past the woman's principle ambition was to find a mate, establish a home, rear her children in such a way that a boy would be a brave soldier, an honest business man or a successful farmer. Every girl was to grow to be a faithful wife and a devoted mother. Most normal men sought and usually found a livelihood of a type that enabled them to maintain a home and support the children in it. Most men were self-respecting citizens and gave no thought to being a burden on society. They were loyal to their community, their state and their country. They taught their children to follow in their footsteps. Paupers were less numerous, criminals were rare, and faith in one's land and the future was firm. Human happiness was far greater then than it is today.

As the decades have come and passed women found their way into industry, where each replaced a man. They found professional avenues alluring in which each one could make a place for herself, again as a substitute for a man. And, only during our present generation, have they found their way into politics. Their work in politics has not measured up to general expectations because political life seems no nearer the ideal than before women suffrage seemed a possibility.

Every woman who can play an important part in professional, business and political life might with even better success fill a more important breach in the life of a worthy man and the lives of healthy children.

Visit if you will the homes and working conditions of our factory women whose existence is not far removed from slavery. See these women whose finer sensibilities are benumbed and distorted to such an extent that they very early are made unfit for their normal place in life. We may well ask ourselves if this is civilization or the result of it? Why are things thus? Why have our people been unable to avoid or remove themselves from this maniac-depressive economic state and go forward along normal lines? What fundamental factors have given us such a wide-

spread social, political and economic mixup and universal loss of confidence and faith?

Inborn in all animal life is that physiological urge which is necessary for the propagation of any particular type. Man is no exception. Most normal humans when approaching adult life, have visions of finding a mate and establishing a home and in it exhibiting that love and devotion that comes only with maintaining a home and the rearing of little children.

In our present state of civilization there are millions of our youth facing certain disappointment. They will be compelled to forego or to stifle that major ambition and lead an unnatural existence. When those millions go forth seeking pleasure and satisfaction that will substitute for that which has been denied them, only those whose paths lead to such experiences can relate the details. That this situation does exist and offers a major social and economic and even governmental problem should cause it to receive more widespread recognition.

If man is to play an inverted role, rock the cradle, stir the larder, and master other household arts, woman must be prepared to go forth to battle and assume the responsibilities of the major affairs of state. If however we are to go forward as in the past, along recognized paths that have been trodden since the dawn of history, then the complexities of modern life must give way in part to more abundant human achievements and happiness through more familiar avenues.

Are the leaders in industry blind with respect to the ultimate possibilities of women in business and the factory? Will they continue to maintain this cheap labor as a guarantee against the many outlets for manufactured goods?

Those millions of women with a wage incompatible with decent living are unable to purchase even the bare necessities. Corporation heads continue to ignore the fact that cheaply paid labor is able to buy merely the essentials. Yet when a person is properly compensated he spends his money, not only for his immediate requirements but for all available luxuries.

Are there those who will not agree that a home-making mother has a full time job? Can a housewife and mother be gainfully employed and still do justice to her home duties? Can her influence be augmented by the experience of being a stenographer or factory worker, by holding some political office, or by being in some professional activity?

Assuming that a woman can be a better wife and mother when her entire energies are directed along those lines which are essential to home making, rearing of children, creating character and devotion in them and in her husband let us hope that we may see more of that.

The effects and their various ramifications of this varied type of living on millions of our homes cannot be discussed in this article. However, the present and future generations of our children will reveal many facts yet to be studied. If human wisdom were as free from fault as it might be, if there were less interference with the natural homing instinct, the birth of our children; and if the same thought and effort and expenditure of money were directed toward care and education of those born in the homes, as is now, more or less wasted in every conceivable type of production control, in the home, in the pig stye and in the fields, there would be a tremendous increase in human happiness.

The present generation of society has endowed woman with an emancipation in excess of any previous one. Has she because of this realized a more full and complete life? After all, what are the secret ambitions of the human female? Do they differ so greatly from her forebears? Or does her environment and daily contacts stimulate those desires that call for a life so different?

Woman's inhumanity to man is deserving of serious consideration. Man's gallantry, his love and his admiration for woman have prompted him to give her the advantage in all human relations. Now she is gradually displacing him. She has taken his job, crowded him out of his profession, is gradually easing him out of political office, denies him a home and has gone far in her quest for alimony. Yet she seeks to maintain his respect and consideration.

No sane man dares question woman's mental status, but there are many who will not agree as to her ability to replace man in all avenues of life. I say all this reservedly, for are there any avenues she has not invaded or made attempts to invade? We will concede the fact that women have a sphere in professional life. It is particularly true where the sick and little children are concerned. That all other professions

cannot be completely maintained by men will challenge the best of thought.

Would that we have the answers to the many questions for in them lies the possible answers or solution to this problem.

Will industry continue to employ millions of women at a wage varying from eight to twenty dollars a week and thus force millions of men and fathers to walk the streets and highways dejected and disgraced? Will industry continue to force the same millions to live unnatural lives, thereby fostering immorality, infanticide, crime and misery? Should the women of this nation be held in virtual slavery to industry while the men idle away their time and substance lining the byways of this country with their human wreckage? Should we hope that industry continue to profit by the life blood of those unfortunates and the buying power of those one step removed from that horrible spectacle?

Woman's superiority we freely admit when she is within her sphere, that of home making, rearing of children and developing those finer qualities so essential in human character. However, that she is inferior to man when placed amid the larger activities where brawn is as essential as brains, should be conceded.

I hope that some of those better able to, would take up the fight to keep man in a man's place and to show woman her responsibility to future generations. In the opinion of one who has personally observed the facts presented, and has been in professional life for a sufficient length of time to learn how this question effects human relations, there is no phase of our national life more vital to the welfare of our country.

Further discussion of this subject is solicited. Favorable comment will emanate from those who are sincerely interested in our future. Adverse criticism will come from those whose lives have seemingly been broadened by strange avenues that have lead them to success.

May we hope that the leaders of American life and thought will lend their influence to bring about a change?

And finally, is there any better means of reestablishing a more stable social, political and economic condition than to remove millions of our women from American Industry and to create more and better homes?

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PROBLEMS ENCOUNTERED IN THE INTERPRETATION OF MECHANICAL AND LABORATORY AIDS TO DIAGNOSIS

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The development of clinical medicine in the last two decades has produced an ever increasing number of mechanical and laboratory aids to diagnosis. To keep abreast of the various advances made it has been necessary, first for the clinician not only to familiarize himself with these advances but also from time to time to keep himself fully informed as to their value, and secondly to purchase expensive apparatus and to equip an adequate laboratory to carry out the various tests devised. To many practitioners this has been a physical impossibility because of the expense, the pressure of business and the rapidity with which new developments occur.

Fortunately no practitioner is so secluded in these days of hard roads and quick transportation that he cannot contact reliable laboratories, thus availing himself of the required information. Unfortunately, however, some are not able properly to interpret the findings obtained nor to evaluate their true importance in arriving at a diagnosis. Especially is this the case when the information comes from laboratories and technical advisors not sufficiently skilled in up-to-date methods to insure reliability of results.

It is amazing to see the credulity with which reports are accepted from laboratories with mechanical instruments poorly conditioned, or from those using impure chemicals purchased at the corner drug store or from unreliable chemical houses, and from those manned by physicians and technicians with such poor scientific ability as to make the most foolhardy question the results obtained. On the other hand infallibility does no exist even with perfect equipment and among the most skilled operators and technicians. Laboratory reports should be accepted only from reliable sources and used for diagnostic conclusions only in conjunction with a good history, a painstaking examination, and an intelligent review of all possibilities connected with the case in question.

Read before Section on Medicine, Illinois State Medical Society, May 20, 1936.

In order to be more specific I shall discuss briefly a few mechanical and chemical aids to diagnosis. The metabolimeter has been sold in increasing numbers each year. The salesman can easily convince the uninformed physician as to the ease of operation and the accuracy of results obtained with his particular machine, but the physician does not have time to operate his own machine and reliable technicians are not made in a day.

Four requisites contribute to satisfactory results in basal metabolism. One very important essential is the use of a scientific machine, one which records the amount of oxygen consumed during a long or a prolonged length of time, and not one which records the length of time required to consume a given amount of oxygen. The latter may give satisfactory results for a normal or a sub-normal but for a hypernormal the reliability of the result is destined to vary inversely with the degree of hyperthyroidism existing; the higher the degree of hyperthyroidism present, the shorter the length of time required to consume the given amount; and the shorter the time, the less reliable the result. The second indispensible requisite is the complete conditioning of the apparatus before each test; the third is the proper preparation of the patient; and the fourth, the employment of a competent technician or operator, one who is mechanical enough to understand the mechanism as well as the procedure, intelligent enough to give each patient minute and persuasive instruction, and self confident and positive enough to obtain from each individual full co-operation. The technique is more difficult than one is led to believe and errors of 10% to 20% may be made, especially by beginners. Even in the best hands a possible error of 2% or 3% may be expected. Also it must be remembered that there are rather wide fluctuations in the daily metabolism of certain individuals. For example the first few tests may be 10% to 20% too high and some normal individuals consistently show rates 10% to 15% or more above or below the normal. These various sources of error may partially neutralize each other, but if they all happen to fall in the same direction the result will be far from accurate. A strict adherence to the basal metabolism test as an index of diagnosis may lead to erroneous conclusions, first because the test does not always give the true metabolic rate, often on account of technical errors, and second because the true basal rate is not always an indication of the correct diagnosis. It is seldom that we should allow any single laboratory test to outweigh a mass of clinical evidence. There are certain conditions according to DuBois in which basal metabolism is frankly misleading:

1. Cases of myxedema and cretinism frequently show a normal rate if they have been taking thyroid while still retaining most of the phenomena of the disease.

2. Exophthalmic goiter patients in remission stages may be considered pathognomonic in spite of normal tests.

3. Certain anemias, fever, or other factors tending to raise metabolism may combat a tendency toward an abnormally low metabolism.

4. Cases not having an increased metabolic rate have been diagnosed as exophthalmic goiter by excellent clinicians.

5. A considerable number of suspected hypothyroid cases fail to show a low rate and, conversely, two-thirds of the suspected hyperthyroids fail to show an increased metabolism.

Some of this last group may be cases of psychoneurosis, effort syndrome, or congestive heart failure in which the rate may be as high as 20% to 40% above normal. If the rate is as high as 50% or more above normal without technical error, thyrotoxicosis is almost certainly present.

In addition to the cases where the basal metabolic rate may be misleading, one should consider the influence of other endocrine disturbances which at times influence the rate. In this field there is no great uniformity of results. There is some evidence of an increase in metabolism in the early stages of acromegaly, although only slight evidence that the secretion of the pituitary gland is concerned with the normal rate of cellular combustion. Also the metabolic rate is variable in disease of the adrenals. Certain anemias, leukemia, and polycythemia often show increased rates.

Considering the above clinical comments one can better evaluate the importance of the basal metabolism. According to Crile it is a valuable but not a specific test for the presence of hyperthyroidism. It has considerable value in the differential diagnosis of borderline cases, but is of little help in the determination of the opera-

bility or prognosis of the individual case of hyperthyroidism.

The second mechanical aid to diagnosis to be discussed is the electrocardiograph. The electrocardiograph is not in common use by the general practitioner both on account of its initial expense and the difficulty of interpretation. These factors should not deter the physician from attaining sufficient familiarity with electrocardiography to know in which cases its use is indicated and the proper evaluation of electrocardiographic findings in hooking up symptomatology, diagnosis and treatment.

Electrocardiographic records permit exact identification and differentiation of disturbances of cardiac rhythm and of cardiac conduction as well as identification of paroxysms of rapid heart action and of other abnormalities. They do not give reliable diagnostic evidence of valvular lesions nor of diseases of the pericardium. To venture a positive diagnosis of a certain type of lesion from the electrocardiograph alone is an unsound practice, even though in occasional instances this seems to be possible.

Electrocardiograms may be perfectly normal even in the presence of serious heart disease. About one-fourth of all cases of angina pectoris show an apparently normal heart by all methods of examination, yet the most valuable evidence of underlying coronary disease is supplied by the electrocardiogram.

Electrocardiography is unquestionably a valuable adjunct to other clinical methods of diagnosis in cardiac disease, but it should be remembered that, like other specialized branches of medical science, it is frequently evaluated by persons whose acquaintance with the subject is only cursory.

In addition to metabolimetry and electrocardiography, roentgenology, bacteriology and chemistry have their place in this discussion. Roentgenological apparatus has reached such a degree of perfection that any good technician can produce good roentgenograms if the proper technique is followed. Correct interpretation of films, however, demands a good foundation in anatomy, pathology and physiology as well as a sufficiently long period of association with some master of the art in addition to a clinical association in order to check up the correctness of his roentgenological diagnoses. The consultation of the roentgenologist with the clinician and vice versa is of the utmost value in diagnosis.

As to bacteriology and chemistry unfortunately expert bacteriologists and chemists are rarely found outside of the larger clinical centers. It is usually necessary for the clinician to send patients directly to laboratories where this service can be obtained or so to familiarize himself with the proper technique of collecting and preserving specimens in such a way as to insure their arrival at the laboratory in good condition. A significent positive blood culture in a case of suspected bacterial endocarditis is of great diagnostic value, but it takes a skilled bacteriologist to produce the evidence.

In using diagnositic mechanical and laboratory aids, I shall mention five conditions with illustrative examples which may either aid or lead us astray:

First: There are certain cases where only these aids alone give the conclusive evidence. Daring indeed is the clinician who diagnoses intraventricular block, a condition in which there are no characteristic signs, without depending on the pathognomonic electrocardiogram. Occasionally the electrocardiogram gives definite aid in the differential diagnosis between upper abdominal lesions and coronary thrombosis. The presence of tubercle bacilli may furnish conclusive evidence in certain obscure pulmonary infections. A high blood uric acid may give the final diagnostic clue in a certain type of the arthritides.

Second: Laboratory findings and mechanical aids have proved to be negative where a clinical diagnosis can be well established. I have seen a chronic kidney-shaped ulcer on the leg with repeated negative serologic tests respond promptly to antileutic treatment. I have had the chagrin of muffing a diagnosis of amebic dysentery where repeated stool examinations failed to show entameba hystolytica. I have not hesitated to diagnose exophthalmic goiter in certain cases where a normal metabolic rate was obtained.

Third: There are those cases where we obtain conflicting laboratory reports. You have all had the experience of obtaining both positive and negative serologic tests in suspected lues. Basal metabolic rates may be so conflicting that careful analysis of the technique and conditions surrounding the test must be brought into play.

Fourth: A failure to use laboratory and mechanical aids leads to error in diagnosis. I recall particularly three cases treated for diabetes mellitus on the basis of sugar in the urine. Two of these were rejected for life insurance and one lost his position in a factory. All three had normal blood sugars and were cases of renal diabetes.

Fifth: Laboratory aids may give positive diagnostic evidence leading to clinical errors in diagnosis. I recall a case of a woman 59 years of age who suffered a severe gastrointestinal hemorrhage. Roentgenograms of the stomach showed a large filling defect on the greater curvature of the stomach. The films were interpreted by three good roentgenologists as carcinoma. At operation no carcinoma was found. The operating surgeon had the good surgical judgment to recognize that the filling defect was due to a large clot of blood in the stomach and promptly closed the abdomen. An uneventful recovery ensued.

Many more examples could be cited from my own experience but I am sure you have all had similar diagnostic conflicts and the purpose of this paper is merely to emphasize the various diagnostic aids and errors in a brief way.

The final solution of the use of mechanical and laboratory aids must be left to the good judgment of the clinician. He has open to him three methods of procedure. Reports may be either accepted or rejected, or confirmation requested. One should not be seduced in diagnosis by mechanical and laboratory reports. Yet neither should one forget that these methods are not only important contributions to medical science, but also beacons of scientific progress. Continued investigation and elaboration of the various mechanical and laboratory procedures will result in much more positive knowledge and in more accurate diagnoses.

JELLY BELLY (PSEUDOMYXOMA PERITONAEI) AND ITS ULTIMATE DEVELOPMENT: (REPORT OF THREE CASES)

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Pseudomyxoma peritonaei, the growth of tumor-like jelly masses on the peritoneum, is a secondary affection. The cause is usually to be found in the appendix or ovary, though cases have been reported in which the primary cause lay in a cyst of the abdominal wall, developed from the remains of the ductus omphalo-entericus, in one case, and in another, a ruptured enterocystoma constituted the starting point of the peritoneal affection. Probably myxomatous formation can occur in any organ containing mucus-producing cells, and by rupturing cause a pseudomyxoma peritonaei, but it is necessary that there be aseptic stagnation, as in the appendix which is closed at its base, and in the ovary which normally produces cystic structures. In both cases the walls are thin and rupture easily under pressure from within or without.

Pseudomyxomatous formations have often been observed at the same time in ovary and appendix, therefore both organs should be inspected at operation even when the origin of the affection in one organ seems certain. Definite recovery can be expected only after thorough removal of the original focus. The gelatine-like secretion of the tumors is produced by the epithelium which, in addition, perishes in many cases. The prognosis is set down as unfavorable, since after a short recovery there ensues a spreading of the tumorous growth. The growth is usually limited to the abdominal cavity, but it can spread through the lymph channels into the diaphragm. The patients at death present a type of cachexia. The prospects are considered unfavorable, because the efforts of the peritoneum to absorb or to organize the tumors impairs its function. A peritoneum in that condition is histologically not recognizable as a

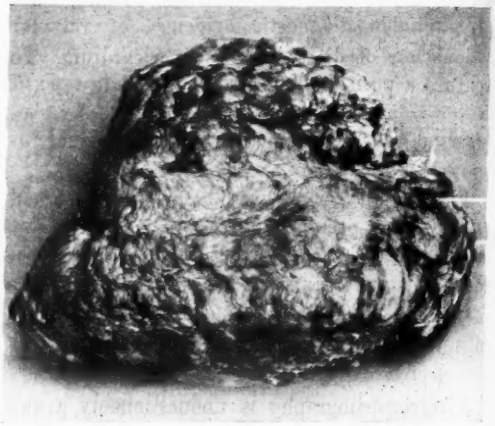

Fig. 1. Pseudomyxoma tumor after successful removal of pseudomyxoma peritonei ex appendice.

peritoneum. It loses its epithelial character, assumes the character of connective tissue, and cannot fulfill its defensive function.

If the appendix is the primary seat, we first find a mucocele, which ruptures after an overproduction of mucus, so that the contents enter the abdominal cavity. There is on record, however a case of H. Gangl[1] in which continuous

Fig. 2. Cross section of pseudomyxoma tumor.

mucus production ensued without formation of a mucocele from an inflamed ruptured appendix. One of the cases to be discussed here seems to be very similar.

If the ovary is the primary seat, it is a case of cystadenoma pseudomucinosum with a similar emptying of the contents into the abdominal cavity.

It has to be kept in mind that not only dead mucus is emptied into the abdominal cavity, but living cells as well, and these are capable of multiplication. They produce the same secretion as the primary tumor and are, therefore metastases by implantation, distinguishing themselves from those of malignant tumors by not spreading through blood- or lymph channels. Neither are they attended by infiltrative growth. They are comparable to artificial tissue cultures.

When the primary tumor is removed, reconstruction can take place depending upon the vitality of the implanted cells and the power of resistance of the peritoneum. The latter tries by absorption and organization to become master of the invaders. If it does not succeed, further spreading occurs. The function of the peritoneum, however, is always impaired, as shown in a case reported by Schley[2] in which strangulation of an umbilical hernia took place four months after operation for pseudomyxoma peritonaei. The hernia was operated upon five hours after the strangulation. The intestinal loop showed only fresh congestion, no injury of the serosa. Nevertheless, death followed thirty-six hours later, due to streptococcus peritonitis. No intestinal gangrene was found at post-mortem. The once strangulated loop could no longer be recognized as such. The visceral as well as the parietal peritoneum had largely thickened and turned gray, although it remained smooth. It had lost its original character and lacked the capacity to overcome a slight infection.

During the absorption of the alien cells there ensues an overflooding of the body with foreign proteins, and eventually a proteinogenic cachexia takes place. Thereby otherwise healthy cell material is absorbed, whereas in the case of cachexia the result of malignant tumors, toxic metabolic products are absorbed. In the case of pseudomyxoma with appendicular as well as ovarian origin living cells are implanted on the peritoneum as is evidenced by the nodules appearing on the peritoneum. The prognosis of pseu-

Fig. 3. Microscopical section of pseudomyxoma tumor.

domyxoma ex appendice is regarded as better, since the invading cell material is less in quantity and shows lesser tendency to grow. The apppendicular cells are normal body cells. The cells from the pseudomyxoma ovarii, on the other hand, are genuine tumor cells with their capacity of unlimited autonomous growth independent of the matrix.

The cases here presented date from three to six years. Two of them healed without a relapse. In one case which was of appendicular origin and therefore prognostically more favorable, a local recidivation of tumorous growth occurred. A myxomatous peritoneum after cystoma of the ovary, however, healed readily. In both cases a second operation for postoperative hernia or fistula had to be done and freedom of recidivation could be ascertained.

CASE REPORTS

Case 1. A woman of thirty years had intermittent pains in the abdomen following a normal confinement four years previously. These pains occurred once a month, often during menstrual period but also independent of it. They spread over the whole abdomen, sometimes centering in the region of the appendix, and again radiating to the right leg. The pains were often combined with nausea and vomiting. The duration was irregular, sometimes the pains lasted two days. She often had to remain in bed and was always constipated, especially during the time of the attacks. On admission to the hospital she was especially sensitive to pressure at McBurney's point, and showed defense musculaire. Abdominal reflex was absent on the lower right quadrant of the abdomen. The leukocyte count was 7,500. The case was diagnosed as chronic appendicitis with acute exacerbations and probably stricture.

Operation disclosed a short, thick appendix, 6x1.2 cm., with the cecal opening closed. It was distended by mucus and the walls were thin. Near the cecal opening there was a small perforation, in vicinity of which the peritoneum of appendix and ileum was covered with pea to bean sized mucous tumors, which could be wiped off easily.

The patient is now, after more than three years, free from symptoms.

Case 2. A forty-year-old woman complained of severe pains in the abdomen and discharge for six months. The abdomen was sensitive to pressure at all points, especially in the left lower quadrant; here muscle tension took place upon touch. After a dose of morphine a tumor-like resistance could be felt at this spot, while the rest of the abdomen was less sensitive. Vaginally there was the same resistance, and a painful enlarged tube was felt. The right side was scarcely sensitive. Leukocyte count was about 12,000.

Upon a tentative diagnosis of pyosalpinx the abdomen was opened. Masses of frog egg-like deposits were disclosed on the peritoneum, especially in the pelvis. The left tube was grown together with an almost fist-sized and apparently abscessed ovary. Ovary and tube were extirpated and the masses of mucus thoroughly removed. A rubber tube and two strips of iodoform gauze were inserted for drainage, because the contents of cystoma looked very much like pus.

The progress was complicated by high fever during the first two weeks. No germs were found in the blood culture. Tube drainage was only serous. After three weeks the patient was discharged from the hospital with the incision closed.

A year later the patient was re-laparotomized because of a hernia, the size of a small fist, which had developed at the site of drainage. On this occasion the abdomen was re-examined and found free of pseudomyxomatous growths.

Case 3. A girl, twenty-two years of age, presented herself for examination with symptoms of an acute appendicitis with perforation. She gave a history of attacks of pain in the abdomen which sometimes centered in the region of the appendix. With the present attack, after three or four days of increasing pain in the lower right abdomen and nausea, there was sudden sharp pain followed by relative painlessness, but there was vomiting. On examination it was noted that the lower abdomen from naval to symphysis was tense and quite sensitive to pressure, and showed comparative dullness on percussion. This was diagnosed as a peritoneal exudation.

Upon opening the abdomen copious jelly masses were found on the visceral peritoneum of pelvis and lower abdomen. The parietal peritoneum was clear, as were both peritoneal layers of the upper abdomen. The appendix was 8 cm. long, hard, and the size of a thumb. On its anterior wall, not far from the cecal opening, there was a small pea-sized opening in which mucus was visible. The vicinity of this opening showed deposits of fibrin, as did an adjacent part of the ileum. On dissection the appendix showed a thick wall and only a very narrow connection with the cecum. Signs of fresh inflammation were not visible. The appendix was distended by mucus. According to all indications, it was a case of former appendicitis, which had led to stricture of the cecal opening and continuous production of mucus from the ruptured opening. Later there must have resulted a closing of the opening by slight adhesions to the ileum. Her most recent attack, which gave the impression of an acute appendicitis, had apparently resulted in a congestion of mucus, increased pressure, breaking of the adhesions and a renewed emission of mucus into the abdominal cavity.

The patient recovered, but returned after a year for re-examination because of pains in the right lower abdomen, and constipation. A tumor-like formation was found in the region of the cecum, either due to adhesions or renewed myxoma formation. At operation, the tumor and the section of the colon from which it arose were removed. Figs. 1 and 2 shows the specimen from the outside and a cross-section. Macroscopically, jelly-like parts could be seen in the tumor. The microscopic examination showed the following: The tumor located on the outside of the intestinal loop consists of the connective tissue rich in young cells. In the connective tissue there are many cavity-like formations which are empty since the mucus fell out. They are surrounded by a capsule of young connective tissue which sometimes emits prolongations into the cavity. There are no epithelial cells visible.

Discussion. In no case was the diagnosis of pseudomyxomatosis peritonaei made. The cases were operated upon as acute or chronic appendicitis and ovarian tumor. In spite of the acute clinical symptoms, perhaps the low leukocyte count should have indicated the origin from a condition not acutely inflammatory.

The first appendicular case was operated at the very beginning of the myxomatous growth, so that the small tumors could be completely removed. The prognosis, therefore, was favorable from the beginning, and the patient has been clinically cured for almost four years.

That quick and definite healing followed the cystoma case is really astonishing, since according to reports hitherto recorded recurrence is the rule. In this case freedom from recurrence has lasted for six years, so apparently the removal of the myxomatous growths was completely successful. Perhaps also the presence of fever in the beginning contributed to a favorable result. The fever reaction was ascribed to the drainage, which was resorted to because the ovary gave the impression of abscess formation, for older cystomas often contain numerous pus cells, and in this case a secondary infection from the tube was assumed. Drainage is usually advised against after operation for cystoma with myxomatosis peritonaei, because the peritoneum has little power of resistance and the drainage can be the source of a secondary infection. The peritoneum shows little tendency toward adhesions. It has lost its epithelial character, appears more like connective tissue and cannot easily overcome infection. In this case, too, almost two weeks were needed to overcome the apparently slight infection, and recovery was achieved at the price of a postoperative hernia only. But perhaps what was in itself a slight infection, stimulated the peritoneum to such an extent that the myxoma could be completely conquered. I call to mind Hoehne's successful stimulation of the peritoneum by camphor oil injections into the peritoneal cavity previous to abdominal operation for cancer of the cervix, where, in older cases, numerous germs are always found in the parametrium. Nevertheless, drainage is a risk, and certainly less dangerous stimulation of the peritoneum can be accomplished by x-ray treatment and other means.

The second appendicular case should have had prospects of undisturbed healing. As a matter of fact, a recurrence did not arise from the peritoneal dissemination of the growths but from the region of the original focus. This pseudomyxoma showed a tendency toward local growth which seemed to be not far removed from transition to malignancy. In this respect the case resembles one reported by O. Wallis[3], which was a pseudomyxoma clinically malignant. In that case there were found two ovarian cystomata that did not rupture. The microscopical examination showed an epithelium with tuft-like protuberances and at places a tendency to something like adenopapillary growth, with polymorphy of the cell nuclei. The patient had to undergo another operation a year later for bowel obstruction, at which time small and large tumors on intentine and omentum were found. His tologically, there was found a cylindrical, mucus-producing epithelium with variations in height and size of the cells, together with widespread polymorphy of the cell nuclei and a tendency to many-tiered growth.

SUMMARY

1. In cases of pseudomyxoma peritonaei both ovary and appendix can be the starting point of the process, therefore both should be inspected even though it is evident that one is the seat, since a simultaneous affection both organs has been found.

2. The pseudomyxomatous deposits should everywhere be carefully removed to aid the peritoneum in the work of absorption.

3. If much pseudomyxomatous material has to be absorbed, proteinogenic cachexia can result.

4. The function of the peritoneum is always impaired by resorption and organization of the myxomatous masses. It is inclined to assume the character of connective tissue, and cannot easily resist infection.

5. For this reason, drainage should generally be avoided, since it might cause a secondary infection.

6. After treatment by use of the x-ray is advisable.

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TREATMENT OF CHRONIC SUPPURATIVE OTITIS MEDIA WITH IODINE POWDER

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One of the most difficult problems the otologist has to contend with is the treatment of chronic suppurative otitis. Among the many methods of treatment are irrigation with various solutions, zinc ionization, therapeutic rays of various types, installation of alcohol, ether, the various dyes such as mercurochrome, acri-violet, acri-flavine, and many other drugs too numerous to mention. About irrigation I shall speak later. Zinc ionization has been largely given up as being of no value. X-ray, ultraviolet ray and diathermy have not come up to expectation. The dyes stain the tissues to such an extent that it is impossible to differentiate the normal from the pathologic. Ether is painful, especially when it reaches the pharynx through a large perforation.

I am sure that all of you have used one or the other of these therapeutic agents at some time. At any rate this has been our experience and at the present time we are using the powder treatment. The powder treatment is not new or original with us. Politzer in his text-book published in 1908, mentions arsenic powder in treatment of certain types of middle ear suppuration. Boric powder, bismuth, aristol and many others have been used. Lederman in 1930 published some astounding results with (Sulzberger) iodine powder.

We have used this in 125 cases over a period of 4 years with satisfactory results. The method of use is practically that described by Lederman.

Before going into the treatment a brief review of the anatomic-pathologic considerations is necessary.

The relation of the eustachian tube to the anterior portion of the middle ear is of importance. Many of the perforations in the anterior inferior quadrant of the drum are caused by ascending infections through the eustachian tube caused by pathology in the nose, adenoids, pharyngitis or tonsillitis. The discharge is usually but not always mucoid in character in these cases.

However, the prognosis is best in this type of pathology.

The close proximity of the epitympanic space to perforations in Shrapnell's membrane anteriorly and that of the antrum to perforations posteriorly need only be mentioned. These perforations, especially if small or covered with crusts, are easily overlooked and are most dangerous, often causing intracranial complications.

The medial boundary of the middle ear and its relation to the promontory, round and oval windows, facial and chorda typmani nerves must not be overlooked. Perforations here may lead to a fistula and labyrinthitis.

Last, but not least, the fact that the mucosa of the middle ear is the periosteum of the bone is of prime importance. Polypi and granulations are nature's protection to the bone but should be removed so that a healthy mucosa may be regenerated.

What is the definition of chronic suppurative otitis media? Many cases show symptoms of chronicity in the acute stage such as formation of polypi, granulations or fetid discharge, but in general, one may say that a discharging ear of from 3-4 months duration may be considered chronic.

Propylaxis. All chronic suppurations of the ears begin as acute except in lues or tuberculosis and should be cured in the acute stage when a simple mastoid operation is usually sufficient. A patient who has had a running ear for from 6-8 weeks is advised to have a simple mastoidectomy. If this could be done there would be very few chronic otorrheas. Scarlet fever otitis with its extensive destruction may occasionally be an exception.

Very often operation is refused by the family or advised against by the family physician.

Patients who come into the clinic or office go through the following routine:

1. A careful examination of the nose and throat for deflected septa, sinus disease, infected tonsils, pharyngitis or adenoids.

2. A routine hearing test with the audiome-

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ter and tuning forks. This should be repeated at intervals.

3. In case of vertigo, nystagmus and other symptoms of labyrinthian irritation, the caloric and Barany rotary tests, as well as an examination for Rhomberg and past pointing.

4. A general examination by an internist.

5. Examination of the drum for location of perforation, presence of polypi or granulations.

6. Bacteriologic study of the secretion.

7. Wassermann and tuberculin tests.

8. X-ray of sinuses and mastoid.

When abnormal conditions are found in the nose or throat these are taken care of by treatment or surgery.

The patient is then instructed to come in daily for the first week. The ear and canal are carefully cleaned out and a wick of xeroform gauze inserted. This has the antiseptic properties of iodoform without the objectionable odor.

At the same time the patient's nose is treated with 2% cocaine or adrenalin packs followed by oil sprays. The ear is inflated, thus forcing the secretions out through the perforation and improving the patient's hearing.

The throat is sprayed with a mild antiseptic solution to remove any secretion and a solution of phenol and ephedrine, each 0.5% in liquid albolene is applied to the nasopharynx with a curved syringe.

General Treatment. The patient is given cod-liver or haliver oil, iron and a diet rich in vitamins.

At the end of the first week, the ear will be considerably cleaner. The patient then comes in every 3-4 days. The nose and throat treatment is repeated and all ear secretion thoroughly removed with peroxide and alcohol and then dried.

If no polypi or granulations are present the iodine powder is blown in. For the first 3-4 weeks the weak or 1% iodine powder is used and then the strong or 2% is applied. In large perforations the powder gains easy access to the middle ear. In smaller ones the powder may be applied by means of a canula through the perforation and if this is impossible the opening is enlarged.

If the ear remains dry, the patient is instructed to leave it alone between visits. If it becomes moist he cleans it with cotton and inserts a few drops of boro-alcohol and a strip of gauze.

No irrigation is permitted as it macerates the tissues and has a tendency to keep up the discharge. Many cases treated in this manner have cleared up when the dry treatment was instituted.

Of the 125 cases treated 55 have been dry for from 2-4 years, 32 were improved and 38 showed no change.

The cases reported are those of uncomplicated suppurative otitis media.

Those showing symptoms of cholesteatoma, labyrinthitis, facial paralysis or introcranial complications were considered operative.

A chronic running ear is not in itself an indication for a radical mastoid operation. The patient cannot be given the assurance that the ear will become dry and the radical must be employed only as a life saving measure.

Since we have used the powder treatment, the radical has become almost a rarity and in many cases a modified operation has proved sufficient.

It not only preserves the hearing but is not nearly so dangerous.

Probably the percentage of cures would be larger if many patients were not lost track of. The secret of the treatment is thorough cleansing of the ear so that the powder may reach the pathology. Filling up the canal with powder is of very little value.

Most of our cases treated showed improved hearing, lessened discharge and odor.

30 N. Michigan Avenue.

DISCUSSION

Dr. Walter Stevenson, Quincy: I am sure that we all agree with Dr. Christoph that cases of suppurative otitis media at times present a difficult problem, and sometimes require niceties of judgment as to when to use surgery. Until about two years ago when my attention was called to the iodine powder of Sulzberger by Dr. Joseph Beck's article, I felt that little could be done for a great many of these cases. Since I have been using the iodine powder I have been astounded at times by the rapidity with which many of these cases clear up. I am keeping a record of these cases and intend to present the analysis of them at a future date. It is, in my opinion, one of the best treatments, and I try it on every type of chronic suppurative otitis. It is of course extremely important that the treatment shall be as outlined by Lederman.

I agree with the essayist in every particular regarding chronic cases. Recurring attacks of pain in a chronic ear, I feel, constitute one of the most important indications for a radical mastoid operation. The statement that "acute suppurative ears should have a simple mastoid operation if discharge persists for from

six to eight weeks" I would modify by the statement that an acute discharging ear with a persistent, copious discharge and positive x-ray findings, and which showed no signs of abatement, should have a simple mastoid operation even without complicating symptoms. Other cases will clear up under conservative treatment even thought the discharge persists for two or three months. I quite agree that acute cases should not be irrigated in the early stages of the disease. If the discharge becomes thick and tenacious, I believe that gentle irrigation of the canal provides more adequate drainage. Routinely, following incision of the drum, I permit the ear to discharge without any treatment whatever. Most of them will clear up in a week or ten days, following which a careful record of the hearing should be made until one is assured that there will be no residual deafness as a result of adhesive processes.

I have enjoyed this presentation very much, and I am glad to know that Dr. Christoph is inclined to conservatism in treatment of chronic cases. Radical mastoidectomy is very seldom indicated; it surely results in almost complete deafness in the average case, and this alone constitutes a contra-indication to operation if the ear can be treated conservatively with safety.

Dr. A. B. Middleton, Pontiac: I agree with Dr. Christoph in everything except three things. I think it is a mistake to inflate an ear and run the risk of blowing infection back into the mastoid through the aditus ad antrum. I think it is a mistake to put foreign substances into an infected ear, like peroxide of hydrogen, for the same reason, and to operate and open the mastoid after five or six weeks, unless you make a smear and find brokendown cells is also a mistake. If there is no bone cell destruction, almost all ears will get well in a reasonable length of time if the ear is kept dry and very clean without using irrigation.

Dr. Joseph C. Beck, Chicago: A few years ago when Dr. Lederman of New York visited me I was preparing a paper on conservative treatment of chronic suppuration of the middle ear, which I knew would cause a lot of discussion, but I thought I had discovered something that was a secret. I found some iodine dusting powder that a man (otologist) was using in Chicago and was not telling anybody about. I got hold of some of this powder and found the action was different from that of anything else I hade ever used. I selected cases, as Dr. Christoph mentioned, particularly cases having no evidence of necrosis in the superior part of the drum gave the best results. When Dr. Lederman came through Chicago some time later he said that that was the powder he had previously recommended. I did not know that. I was surprised at the results following its use.

I think the last speaker said a mouthful about the use of a remedy that has the property of forcing its way into places where it is not wanted. I do not use peroxide of hydrogen. Blowing anything into the ear is not so good, but if done as Dr. Christoph does it, I see no objection. He left out one point; in eliminating secretion from the attic or from the eustachian tube, you can often by means of capillary suction clean the ear preparatory to the use of iodine powder. This home made powder spoken of here it seems to me will not do, however. I admit the powder is costly. When I recommended it and used the manufacturer's name, I received so many letters wanting to know when and where they could obtain the powder, that I felt it best to give the name, thus saving a lot of correspondence.

Dr. Christoph mentioned one thing which you may not have noted; that is the operation in connection with chronic suppuration, a conservative operation. I do not see how you can get any results from the powder if there is any suppuration emptying into the antrum. The powder will dry it up for a while then it will come back, and that is an indication to do a simple mastoid operation. There is no use in keeping up the powder treatment if you do not get results soon. If you can cure them every time they come to you, of course that is all right, but you will not heal a fistulizing type of mastoiditis, so far as our own experience goes. I think if we all narrowed down to this particular treatment and talked about it, we will see something come of it. The hearing tests is one of the indications that you are getting somewhere. Many times the hearing is affected by secretions, and if you make your tests frequently you will see what results you are obtaining.

Dr. George Woodruff, Joliet: I wonder if you have noted the therapeutic effect in x-ray pictures of the mastoid. I am convinced in some cases of running ears, not many, possibly running a couple of months, with no signs of any active mastoid disease, where there is considerable thickening of the mucosa which you can see through the perforation, that the taking of x-ray pictures has had a marked effect on clearing that ear up in a few days, when it showed no signs of doing so before. I was interested at the American Medical Association meeting to see the x-ray pictures shown by a doctor from New York. He has made his own pictures. He stressed the point that he had noted a therapeutic effect from ordinary x-ray pictures. He makes a mastoid picture right away on each side, then if there is a favorable reaction, two or three days later he gives the treatment, and repeats it. If he does not get a favorable result by the first picture, he probably does not repeat. I am quite convinced that I have seen definite improvement in some cases after x-rays have been taken.

Dr. J. A. Oliver, Charleston: I understand that the essayist begins his nasal treatment by using 1% cocaine in 1:2000 adrenalin and follows that with ephedrin in oil as a spray. I believe it has been proved that oil inhibits the action of the cilia and I have discontinued its use. I have been using ephedrin in normal salt solution instead and believe I get far better results.

Dr. Carl H. Christoph, Chicago (in closing): I am very glad that this paper brought out so much discussion. I discussed the matter with Dr. Cavanaugh some months ago and he said he wanted something short and practical and that is what I endeavored to present. I agree with Dr. Stevenson that we should not set an arbitrary time when an operation should be done. As I mentioned before some ears stop discharging after two or three months and some are chronic after the first two or three weeks.

I never considered having the powder made because the amount used is so small that it did not seem worth while.

In answer to Dr. Middleton that inflation is dangerous I would say that we have used inflation not only in chronic but in acute suppurative ears for twenty-five years and I have never seen any serious consequences.

I am sure that there is something in Dr. Woodruff's theory. Professor Neumann of Vienna recommended x-ray treatments for those cases which continued to discharge after simple mastoidectomy and I have found them very useful in my cases.

We use a 0.5% ephedrin with a 0.5% phenol in liquid petrolatum. This is instilled into the nasopharynx with a curved syringe and allowed to run out of the nose. We use a 0.5% ephedrin because it burns less than a 1% and in my opinion the albolene is better than water as a vehicle.

Dr. Beck's discussions are always helpful and I agree with his remarks on the modified radical. As far as peroxide is concerned I have never seen any bad results from the use of it and its power as a machanical cleansing agent cannot be denied.

APPENDICITIS IS AN EMERGENCY

GOLDER LEWIS McWHORTER, M. D.

Associate Professor of Surgery, Rush Medical College of the University of Chicago

CHICAGO

It has been shown that the appendix had ruptured in one-third of all cases of acute appendicitis coming to one typical general hospital twenty-four hours after the onset and forty-eight hours from the onset rupture had occurred in one-half of them with the development of serious complications (Taylor and Schmidt[1]).

Rupture was more common in those under ten and over forty years of age.

Acute appendicitis occurred most frequently between the ages of ten and twenty years, and nearly 80% of all cases occurred between the ages of ten and forty. It has been found to occur nearly one-third more frequently in the male than in the female.

Symptoms of appendicitis vary from the mild to the severe and they may become chronic. This increases the difficulty of diagnosis and may confuse the patient into a belief that he has nothing serious.

Contrary to popular belief that acute appendicitis is always associated with severe pain beginning in the right side, the usual onset of symptoms begins with distress over the upper or the entire abdomen. Sometimes the pain is entirely on the left side even with perforation in a pelvic appendix.

The pain may be cramp-like or constant and of almost any grade of severity. Usually a few hours after the onset the pain or soreness localizes in the right side or at least in the lower abdomen. Nausea and vomiting sometimes occur.

When cathartics have been taken by the patient early in the attack abdominal distress from their action may confuse the patient and later the physician in the diagnosis of appendicitis, resulting in dangerous delay.

The pain usually becomes worse until gangrene or rupture occurs when there may be some temporary relief. This may be termed the crucial period because there may still be time to avoid spreading peritonitis or abscess by immediate operation, although the patient may believe he is getting better, because the pain is not so severe. Prompt and skillful surgery followed by efficient hospital treatment are necessary at this stage of appendicitis.

It is recognized by physicians that some cases of appendicitis are difficult to diagnose early before rupture and peritonitis occur. This is not likely to occur if the physician is permitted to make frequent examinations and is not informed that he will be called the next day if the patient is worse.

Taylor and Schmidt found that in 26.3% of all patients with acute appendicitis rupture had occurred before entrance. They found the incidence of rupture had increased over a four year period from 11.5% to 33.3% with a proportionate increase in mortality. Among those who entered before rupture of the appendix occurred only one out of a hundred died. Schullinger[2] reported a mortality of 0.59% in acute appendicitis before and a mortality of 8.6% after peritonitis had occurred.

The taking of cathartics in an attack of appendicitis increases the frequency of rupture and peritonitis. In a survey of patients entering the hospitals of Philadelphia during a three year period Bower[3] found that over two-thirds gave a history of taking cathartics before going to the hospital. Of those who had taken cathartics of any kind one in sixteen died, while among those who did not take cathartics only one in 109 failed to recover. Of those who received one

Presented over the radio, March 24, 1936, under the auspices of the Illinois State Medical Society.

laxative, one in eighteen died, while of those who received more than one laxative, one in ten died. One should never take a cathartic where there is the slightest possibility of appendicitis. An operation carries almost no risk when compared to the danger of taking a cathartic in acute appendicitis.

There are a number of factors which physicians consider in determining the course of treatment of complications from appendicitis. The chief ones are abscess and peritonitis resulting from rupture of the appendix. In recent years there have been many helpful additions to the hospital management of these serious complications.

In spite of many scientific advances and improved surgical knowledge and skill, there has been a constantly increasing death rate from ruptured appendicitis. Over a twenty year period following 1911 the number of deaths in children under five years from a ruptured appendix increased over 100%.[4] The deaths in all males increased 20% and in females 14%.

Records since 1911 indicate that the increased number of deaths from appendicitis is due to an actual increase in the incidence of the condition in recent years (Seifert[5]). Many are treated with home remedies and the physician is not called until complications develop. The treatment of appendicitis after perforation or with extensive inflammation necessitates the use of the greatest amount of experienced judgment and medical skill. Delay in early operation prolongs the hospital stay and the return to normal activity.

There is one point on which all physicians agree, and that is operation in appendicitis before rupture and complications can occur. If this ideal is to be accomplished it will necessitate operation as soon as the diagnostic symptoms of acute appendicitis develop.

There are many other conditions, some of them also requiring immediate operation, which always must be considered in the differential diagnosis. The judgment and experience of the physician is the only safeguard of the patient in determining the advisability of delay in hospitalization and operation.

It is important that the patient or his parents understand the tremendous risk of rupture of the appendix by only a few hours' delay in operation, after the onset of symptoms which frequently are not associated with a great deal of pain or disability. It is not unusual to see a patient walk into the hospital with a ruptured appendix.

The treatment of appendicitis after complications have developed must be determined by the physician. No general rule can be made since every case presents a somewhat different problem. Operation may not be indicated in certain types of local and general peritonitis. However, the condition is always a serious one, and one must be prepared for an emergency operation.

In suspected appendicitis repeated visits by the physician are necessary during the first twenty-four hours and, where it is possible, removal of the patient to the hospital to observe the development of further symptoms.

Usually the diagnosis of appendicitis can be made by the experienced physician. Operation should then be performed without delay before rupture or other dangerous complications can occur.

Mild attacks of appendicitis sometime occur which cannot be recognized at first. Although appendicitis is most commonly observed in a young person, every "stomach" complaint at any age should be viewed with suspicion. In children confusion with abdominal distress due to improper eating is a common cause for delay in diagnosis.

After one attack of appendicitis there is always the imminent danger of a more severe recurring attack. Frequently with mild attacks the inflammation and symptoms become chronic and then the diagnosis may be more difficult.

If the appendix is not removed following rupture or due to some other complication, it should be removed within two or three months or as soon as feasible.

Why, do you ask, are there over 18,000[4] largely avoidable deaths each year from acute appendicitis in the United States? It is due to delay in diagnosis, attempted self-medication by cathartics, late hospitalization, and operation after rupture has occurred. Complications are chiefly due to the patient's desire to "wait until tomorrow," to call for home remedies before calling the physician and to postpone going to the hospital.

There is a minimum risk in early operation by the experienced physician in well-organized hospitals. *There is grave danger in delay.*

Appendicitis is an emergency!
1526 W. 103 Street.

REFERENCES

1. Taylor, A. C., and Schmidt, E. R.: Acute Appendicitis. Trans. of the Western Surgical Assn., 1933, p. 249.
2. Schullinger, R. N.: Acute Appendicitis and Associated Lesions. Arch. Surg., 32: 65, 1936.
3. Bower, J. O.: Acute Appendicitis in Philadelphia. J. A. M. A., 102: 813, 1934.
4. Eighteen Thousand Deaths from Appendicitis. Why? Statistical Bulletin, Metropolitan Life Insurance Company, 11: 1, 1930.
5. Seifert: Deutsche Ztschr. f. Chirurgie, Berlin, 244: 176, 1934.

BACKACHE

Pain in the back may be referred from distant organs or be the result of diseased or misplaced contiguous organs. Both must be differentiated from backache arising from disease of the vertebral column itself.

In backache due to disease or displacement of distant organs, the pain is usually localized (when the pathologic condition is in the aorta, heart or lungs) in the upper portion of the spine, between or above the scapulae. Stomach, gall-bladder, etc. conditions give rise to pain in the dorsal region; a retroverted uterus or a bladder condition may cause a lower-lumbar pain.

Diseases of the mediastinum and inflammations of the pleura may cause upper dorsal and cervical pain. In the lower portion of the spine, kidney, pancreatic, prostatic and seminal vesicle disease can be factors.—Dr. P. Kruescher, in *Bull. Amer. Hosp., Chicago,* Nov., 1932.

Society Proceedings

COOK COUNTY

CHICAGO MEDICAL SOCIETY

Regular Meeting, Wednesday, January 6, 1937

PROGRAM

Compound Comminuted Fractures of Both Bones of the Leg Treated With and Without Antiseptics, Chester Zeiss and John J. Reynolds.

Discussion, Harry Mock.

Fractures of the Neck of the Femur—A New Method of Treatment, Carlo S. Scuderi and James J. Callahan.

Discussion, Paul B. Magnuson and E. W. Ryerson.

Fractures of the Femur—Per Trochanteric, Shaft and Condyles, William R. Cubbins.

Discussion, George G. Davis.

Wednesday, January 20, 1937

PROGRAM

Scarlet Fever Prevention, Clarence A. Earle.

Discussion, Arthur H. Parmelee and Archibald Hoyne.

Constriction Ring Dystocia, Louis Rudolph.

The Treatment of Simple Sprains, E. H. Ochsner.

HANCOCK COUNTY

The Hancock County Medical Society met in annual session at Carthage Hotel, Tuesday evening, January 5, 1937, at 6:30.

Dr. E. P. Coleman of Canton, Ill., District Councilor of the 4th district, gave a very interesting talk on Medical Economics. He was accompanied by Mr. Russell Reeder, one of his office staff, also of Canton.

After the dinner election of officers resulted as follows:

President, Roland A. Slater; vice-president, M. V. Prescott; secretary-treasurer, W. P. Frazier; censors, E. L. Kingsbury and Blair Kelly; delegate to state medical society, W. L. Irwin; alternate to state medical society, W. P. Frazier; directors, Dale F. Scott, five years; Roland A. Slater, four years; W. P. Frazier, three years; E. L. Kingsbury, two years; W. L. Irwin, one year.

W. P. FRAZIER, *Secretary.*

Personals

Dr. Harry Gradle has been appointed consulting ophthalmologist to the Indian Medical Service, U. S. Department of Interior.

Dr. Theodore Cornbleet, among others, addressed the Chicago Pathological Society, January 11, on "The Rôle of Calcium in Scleroderma."

Dr. Walter Schiller, University of Vienna, discussed gynecologic endocrinology before the Springfield Medical Club, January 19.

At a meeting of the West Side Branch, December 17, Drs. Eugene T. McEnery and Paul H. Holinger spoke on bronchiectasis in children.

Dr. Francis D. Murphy, Milwaukee, addressed the Englewood Branch of the Chicago Medical Society, January 5, on "Management of Cardiovascular Renal Diseases."

Dr. Charles J. Drueck, Chicago, addressed the McLean County Medical Society in Bloomington, January 12, on "What Brings the Anorectal Patient to the Doctor."

On January 27, 1937, at Taylorville, Dr. Earl O. Latimer of Chicago addressed the Christian County Medical Society members on "Abdominal Pain from a Surgical Standpoint."

On January 19, 1937, Dr. Ralph A. Reis gave a gynecological clinic for the Sioux Valley Medical Society, Sioux City, Iowa, and delivered an address on "The Third Stage of Labor."

The North Shore Branch devoted its meeting, January 5, to case reports by the staff of Swedish Covenant Hospital: Drs. Ralph A. Davis, Ray-

mond F. Elmer, Oscar T. Roberg, Eric Oldberg and Willard Van Hazel.

Dr. Henry F. Helmholz, Rochester, Minn., discussed "Mandelic Acid in the Treatment of Urinary Infection in Childhood" before the North Side Branch, January 7, and Dr. Charles W. Mayo, Rochester, "Digestive Qualifications of Man."

The German Medical Society of Chicago was addressed December 8 by Drs. William C. Beck on "The Recognition and Management of Peripheral Arterial Disease" and Samuel Perlstein, "The Electrocardiogram as an Aid in Clinical Medicine."

Arnold Emch, Ph.D., has been appointed executive director of the Chicago Hospital Council, succeeding Perry Addleman, who has been appointed to a similar position with the Hospital Service Corporation.

At a meeting of the Peoria City Medical Society, Peoria, January 5, Carlos I. Reed, Ph.D., and Dr. Irving E. Steck, Chicago, spoke on "Mineral Metabolism in Arthritis Under Treatment with Vitamin D" and "Clinical Experience in Treating Arthritis with Vitamin D" respectively.

Dr. William DeHollander, Green Bay, Wis., has been placed in charge of the x-ray department of St. John's Hospital, Springfield, succeeding Dr. Lawrence M. Hilt, who has been appointed to a similar position with Butterworth Hospital, Grand Rapids, Mich.

Dr. Thomas Parran, surgeon general, U. S. Public Health Service, Washington, D. C., will deliver the Gehrmann Lectures for 1936-1937 at the University of Illinois College of Medicine, January 25, 26 and 27. His subjects will be "Health as a Factor in Social Security," "Industrial Hygiene" and "Syphilis."

The Chicago Gynecological Society was addressed, January 15, by Drs. Henry Close Hesseltine on "Experimental and Clinical Therapy of Vulvovaginal Mycosis"; Herbert E. Schmitz, "Mortality and Complications of 3,129 Supracervical Hysteromyomectomies," and Edwin J. DeCosta and Ralph A. Reis, "The Oral Administration of Paraldehyde for Relief of Pain During Labor."

The Chicago Council of Medical Women held a joint meeting with the Medical Women's Club, January 13; the speakers included William S. Peterson, Ph.D., on "The Patient and the Weather"; Marian Hood, "Amebiasis with Demonstration of Living Parasites," and Dr. Marie L. Connelly, "Changes Occurring in Hodgkin's Disease."

Dr. Ernest W. Goodpasture, professor of pathology, Vanderbilt University School of Medicine, Nashville, delivered the thirteenth Ludvig Hektoen Lecture of the Frank Billings Foundation before the Institute of Medicine of Chicago, January 22. The subject of his illustrated lecture was "Vaccinia."

Dr. Irving S. Cutter, since 1925 dean of Northwestern University Medical School, Chicago, and since 1934 health editor of the Chicago *Tribune*, has been appointed medical director of the Chicago and North Western Railway. He has also been medical director of Passavant Hospital since 1928. Dr. Cutter will continue to hold his other positions. He graduated from the University of Nebraska College of Medicine, Omaha, and was identified with his alma mater from 1910 to 1925, holding the deanship for the years 1915-1925. Dr. Victor H. Horning has been named assistant to Dr. Cutter in his new position.

Doctor Meyer A. Perlstein has been invited to address the parent teachers association of the Hitch school on January 21st on the "Relation of Health to School Work."

Dr. Max Thorek addressed the Academy of Medicine of Terre Haute, Indiana, on Electrosurgical Obliteration of the Gallbladder on January 8th.

Dr. Daniel L. Sexton, Instructor in the Department of Internal Medicine, St. Louis University, read a paper on "Endocrinology in General Practice" before the Madison County Medical Society at Madison, Illinois, January 8, 1937.

Dr. Ralph B. Bettman gave a paper on "Surgical Treatment of Empyema of the Chest," before the Whiteside County Medical Society, at Sterling, on January 18.

Drs. C. I. Reed and I. E. Steck presented a program on Arthritis before the Peoria Medical Society on January 5th. Dr. Reed spoke on "Mineral Metabolism in Arthritis Under Treatment with Vitamin D" and Dr. Steck on "Clinical Experience in Treating Arthritis with Vitamin D."

At a meeting of the Chicago Society of Allergy, January 18, Dr. Francis L. Foran, among others, discussed "Treatment of Hay Fever with a Modified Pollen Solution."

The Chicago Pediatric Society was addressed, January 19, among others, by Dr. Frederic W. Schlutz on "Treatment of Nephrosis in the Young Child."

Dr. Arthur J. Bedell, Albany, N. Y., addressed the annual meeting of the Chicago Ophthalmological Society, January 18, on "The Ophthalmoscopic Signs of Failing Health."

The Chicago Roentgen Society was addressed, January 14, by Drs. Bernard H. Nichols, Cleveland, on "Significance of Anomalies of the Kidney and Ureter," and Jacob Sagel, Gary Ind., "Ewing's Tumor of the Femur."

News Notes

Dr. Philip H. Kreuscher, assistant professor of surgery, Northwestern University Medical School, has been appointed chief surgeon of the Carnegie-Illinois Steel Corporation in the Chicago area. He succeeds Dr. George C. Davis, resigned. Dr. Kreuscher graduated from Northwestern in 1909 and has been teaching there since 1915. He was formerly medical director of the Illinois Industrial Commission and in 1933 was president of the Illinois State Medical Society.

Dr. Milton M. Portis, Chicago, has been appointed a member of the professional committee for medicine in the Illinois State Department of Registration and Education, to fill the vacancy caused by the death of Dr. Gilbert FitzPatrick. Dr. William L. Karcher, Freeport, was appointed to succeed the late Dr. Malcolm L. Harris, Chicago. Dr. Portis, a graduate of Rush Medical College, was formerly clinical professor of medicine at Loyola University School of Medicine. Dr. Karcher graduated from the Medico-Chirurgical College of Philadelphia in 1900. Other members of the committee are Drs. John R. Neal, Springfield, secretary, and Arthur H. Geiger, Chicago. There is still one vacancy on the committee.

The state department of health has added a question box service to its weekly radio broadcast. The department will undertake to answer or discuss over the air questions of general interest concerning preventive medicine that may be submitted by listeners. Questions may be forwarded direct to the state department of public health at Springfield or to WGN, Chicago.

The Hines Memorial Hospital at Hines has been placed under quarantine for an indefinite period on account of the prevalence of influenza, it was reported December 30. While there is no outbreak among the 1,750 patients in the hospital, the step was taken as a precautionary measure. During the quarantine, visitors will be admitted only in case of emergency.

The Chicago Heart Association held its fifteenth annual meeting at the Congress Hotel, January 14. Dr. Thomas Duckett Jones, instructor in medicine, Harvard University Medical School, Boston, discussed "The Natural History of Rheumatic Fever and Heart Disease with Especial Reference to Etiology and Prognosis."

The General Education Board of the Rockefeller Foundation has given to the University of Chicago $3,000,000 for the development of the medical school and the improvement of the university generally. Of $360,000 to be devoted to medicine, $250,000 continues present grants. The remainder will finance thirty-six beds in Billings Hospital which have already been converted to free beds and ten additional free beds added in the Bobs Roberts Hospital for children through immediate use of the funds. With the increase in beds, 218 of the 518 beds in the various hospitals in the University Clinics will be entirely free. This figure of 218 beds does not include part pay beds or those used as free beds because of special circumstances, although designated as being for paying patients. According to the university, 47.69 per cent of the work done in the clinics in November was free, and this percentage represents the usual average of unpaid service provided. The establishment of the University of Chicago Clinics and medical laboratories, which were formally opened in 1927, was made possible largely through the assistance of the General Education Board.

The Marshall Field & Company Annex Building window now carries an exhibit loaned by Dr. Hull of the American Medical Association. There are two wax models representing "Aseptic Surgery," the other "Anesthesia," with the figures of Lord Lister and William Morton, and a very short history of their accomplishments.

Deaths

CLARENCE E. AXLINE, Peoria, Ill.; Louisville (Ky.) Medical College, 1881; aged 80; died, Nov. 1, 1936, of arteriosclerosis and myocarditis.

JOHN EDDOWES BEEBE, Chicago; Gross Medical College, Denver, 1895; aged 84; died, Nov. 14, 1936, of coronary thrombosis and arteriosclerosis.

JAMES M. BEVERIDGE, Oregon, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1898; a Fellow, A. M. A.; past president of the Ogle County Medical Society; chairman of the county exemption board during the World War; aged 68; died, Nov. 21, 1936.

WILLIAM H. BOHART, Vero Beach, Fla.; Rush Medical College, Chicago, 1891; formerly a practitioner in Chicago; at one time assistant clinical professor of surgery, Loyola University School of Medicine, Chicago; formerly on the staffs of St. Bernard's and Englewood hospitals, Chicago; for many years chief surgeon to the Chicago and Eastern Illinois Railroad Company; aged 67; died, Nov. 14, 1936.

JAMES B. BRYANT, Lawrenceville, Ill.; Louisville (Ky.) Medical College, 1889; formerly a master in chancery for Lawrence County circuit court; aged 76; died, Nov. 21, 1936, of bronchopneumonia and bulbar paralysis.

WILLIAM WESLEY COOK, Chicago; Physio-Medical Institute, Cincinnati, 1882; aged 77; died, Dec. 28, 1936, of influenza and lobar pneumonia.

WALTER LOUIS FINN, Iuka, Ill.; Missouri Medical College, St. Louis, 1899; member of the Illinois State Medical Society; state senator; served during the World War; aged 61; died suddenly, Nov. 7, 1936, of angina pectoris.

CHARLES EDUARD MAX FISCHER, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1907; formerly associate professor of medical biology, histology and embryology at his alma mater; aged 55; died, Nov. 16, 1936.

LOUIS G. HARNEY, East St. Louis, Ill.; Northwestern University Medical School, Chicago, 1903; member of the Illinois State Medical Society; served during the World War; member of the staff of St. Mary's Hospital; aged 57; died, Nov. 16, 1936, of heart disease.

HUGH OWEN JONES, Chicago; Northwestern University Medical School, Chicago, 1902; member of the Illinois State medical Society; assistant to the president and chief of the medical service, city health department, and formerly assistant and acting health commissioner, and chief of the division of child hygiene; aged 61; died, Dec. 24 1936, of broncho-pneumonia.

JAMES FRANCIS LAWSON, Chicago; Howard University College of Medicine, Washington, D. C., 1907; served during the World War; member of the city board of health; aged 51; died, Nov. 3, 1936, in the Veterans Administration Facility, Hines, Ill., of hypertension and valvular heart disease.

WILLIS A. MANSFIELD, Washington, Ill.; Chicago Medical College, 1884; aged 78; died suddenly, Oct. 30, 1936, of heart disease.

ARTHUR G. MESERVE, Robinson, Ill.; Miami Medical College, Cincinnati, 1874; member of the Illinois State Medical Society; past president of the Crawford County Medical Society; for many years a member of the school board and board of health; aged 82; died, Nov. 14, 1936, of cerebral hemorrhage and chronic myocarditis.

CHARLES HIMES METZEL, Sidney, Ill.; University of Illinois College of Medicine, Chicago, 1931; member of the Illinois State Medical Society; on the staff of the Mercy Hospital, Urbana; aged 31; died, Nov. 20, 1936.

ALBERT GEORGE PAINE, Chicago; University of the City of New York Medical Department, 1877; aged 88; died, Dec. 3, 1936, in Pasadena, Calif., of bacillary dysentery.

HUGH JAMES POLKEY, Chicago; Rush Medical College, Chicago, 1903; a Fellow, A. M. A.; assistant clinical professor of surgery (genitourinary) at his alma mater; member of the American Urological Association; on the staff of the Presbyterian Hospital; aged 59; died, Nov. 14, 1936, of arteriosclerosis and coronary thrombosis.

SAMUEL BREESE SMITH, Chicago; Dartmouth Medical School, Hanover, N. H., 1893; aged 73; died, Oct. 8, 1936, of cerebral hemorrhage.

JOSEPH P. SMITH, Chicago; Rush Medical College, Chicago, 1888; a Fellow, A. M. A.; clinical professor of medicine, Loyola University school of Medicine; on the staffs of St. Bernard's Hospital and the West Side Hospital; aged 74; died, Dec. 15, 1936, of coronary thrombosis.

JOSEPH C. SPRINGER, Chicago; College of Physicians and Surgeons of Chicago, 1896; for many years coroner's physican and formerly criminologist to Chicago and Cook County; aged 69; died, Nov. 3, 1936, of uremia and chronic nephritis.

GEORGE W. TORREY, Chicago; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1895; also a dentist; aged 65; died, Dec. 12, 1936, of coronary thrombosis.

JOHN A. TUTHILL, Le Roy, Ill.; State University of Iowa College of Medicine, Iowa City, 1881; formerly mayor and member of the school board; aged 81; died, Oct. 7, 1936, of angina pectoris.

WALTER JAMES WILLIAMS, Edwardsville, Ill.; Meharry Medical College, Nashville, Tenn., 1918; aged 44; died, November 17, 1936, in St. Elizabeth Hospital, Granite City, of self inflicted wounds.

JAMES S. MATHESON WYLIE, Chicago; Harvey Medical College, Chicago, 1895; aged 70; died, Dec. 10, 1936, of coronary thrombosis.